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ABSTRACT

In this study, data from the records of 944 college preparatory high school graduates were collected. In a follow up study of 364 of the graduates, stuents with high enrollments in the arts (art, music, and drama) were compared with other students on the basis of achievement in high school academic subjects, enrollments in college arts courses, and college grade point average. Multiple linear regression analyses were used to determine the effects of high enrollment in each of the high school subject areas on grade point averages in college academic subjects. In addition, the number and distribution of high school academic subject units earned by the sample students were compared with the entrance requirements of 200 colleges and universities to determine if study school students could enroll in more arts subjects and still meet the specific subject requirements of colleges with selective admission policies. Results showed that with I.Q. and sex variables controlled, enrollment level in high school arts subjects had no significant effect on either high school or college grade point averages in academic subjects. Students with high arts enrollments in secondary school had higher arts enrollments in college; high enrollment in the arts neither aided nor penalized students in academic subject area achievement. (Author/RA)

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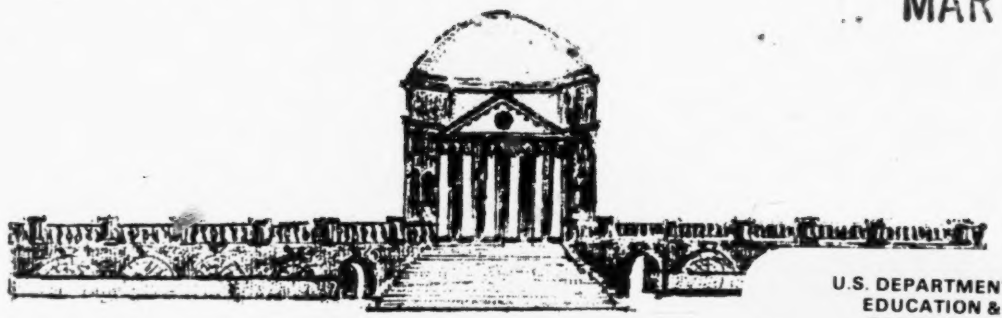

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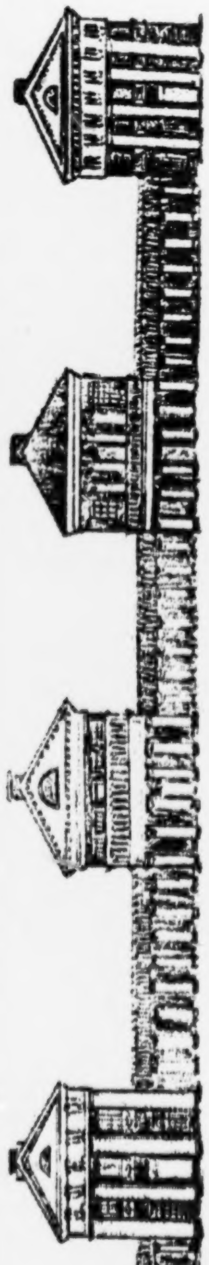

A STUDY OF THE RELATIONS OF EDUCATION IN THE ARTS TO GENERAL ACADEMIC ACHIEVEMENT BY SECONDARY AND COLLEGE STUDENTS

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JULY 1971

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ABSTRACT

A STUDY OF THE RELATIONS OF EDUCATION IN THE ARTS TO GENERAL ACADEMIC ACHIEVEMENT BY SECONDARY AND COLLEGE STUDENTS

By

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Charlottesville, Virginia

In an eight-year (1959-1967) longitudinal study, data were collected from high school records of 944 college preparatory students who graduated from three comprehensive suburban high schools in Maryland. The schools were described as being typical of many American high schools in terms of enrollment, curricular offerings, socio-economic background of students, and proportion of graduates attending college. Follow-up data were obtained for a sample of 364 of the graduates who entered 104 accredited four-year colleges and universities or enrolled in a college transfer program in a local community college. Complete data were obtained for 98 per cent of the students eligible for inclusion in the college follow-up phase of the study.

An analysis was made of the extent to which the sample students enrolled in high school arts subjects (music, art and dramatics) and enrollment trends in these subjects were noted for the period under study. The sample was stratified to reflect students with high levels of enrollment in high school arts, physical education, English, social studies, science, mathematics, and foreign language. Students with high arts enrollment were compared with other students on the basis of selected variables including achievement in high school academic subjects.

Multiple linear regression procedures were used to determine the effects of high enrollment in each of the high school subject areas upon grade point averages in college academic subjects. Separate analyses were made for students with continuous college enrollment and for those who withdrew from college. Appropriate covariance techniques were used as controls for I.Q. and sex variables.

The number and distribution of high school academic subject units earned by the students included in the study was compared with the published entrance requirements of a sample group of 200 colleges and universities to determine if students in the study schools could enroll in more arts subjects and still meet the specific subject requirements of colleges with selective admission policies.

The findings indicated that one-fourth of the sample students enrolled in no arts subjects in grades nine through twelve and approximately 40 per cent elected no arts subjects past the ninth grade level. When enrollment units in non-academic subjects were equated with units of credit earned in academic subjects, 41.5 per cent of the sample students earned less than one unit in an arts subject during their four years in high school. The proportion of girls who enrolled in arts subjects was higher at each grade level than was the proportion of boys. A higher proportion of boys enrolled in no arts subjects in grades nine through twelve. There was a significant trend during the period of decreasing enrollment in arts subjects by college preparatory students in the three study schools. This was especially evident at the ninth grade level and enrollment losses were heavier among boys than girls.

Twenty per cent of the sample students earned three or more enrollment units in high school arts subjects. A comparison of these students with other students in the sample revealed few significant differences. There was a higher proportion of female students in the high arts group and this group earned slightly less credits in academic subjects than did other students. Mean I.Q. and grade point average in high school academic subjects were almost identical for the two groups, as was the proportion of each which entered or withdrew from college. There were no significant differences between high arts students and other students in terms of major and minor fields of study in college. A significantly larger proportion of the high arts students enrolled in more than six semester hours of arts subjects during their first two years of college. There was a significant increase during the period in the proportion of sample students who enrolled in at least one arts course during their first two years of college.

When I.Q. and sex variables were controlled, enrollment level in high school arts subjects had no significant effect upon either high school or college grade point average in academic subjects. Thus, it would appear that the sample students who elected additional arts subjects in high school were neither aided nor penalized in terms of academic achievement by the fact that they devoted a larger proportion of their high school program to the arts than did other students. The

same statement could be made for the sample group regarding level of enrollment in three of the five academic subject areas. Level of enrollment in high school English, social studies and science had no significant effect upon college GPA in any of the five academic subject areas or upon the composite GPA in these subjects. This was true for both students with continuous enrollment in college and for those who withdrew from college.

High enrollment in foreign language had a significant positive effect upon college GPA's in English and foreign language and upon the composite GPA in academic subjects for students with continuous college enrollment, but had no significant effect upon college GPA's in academic subjects for students who withdrew from college. High enrollment in high school mathematics had a significant positive effect upon college GPA's in mathematics and science for both continuous enrollment and withdrawal students, but had no significant effect upon college GPA's in the other three academic areas or upon the composite GPA in academic subjects.

All students in the sample earned at least seventeen high school units in college preparatory subjects and, with very few exceptions, earned four units each in English and social studies and three units each in science, mathematics and foreign language. Mean number of high school academic subjects earned by the sample students was 18.58 units. This preparation exceeded the number of specified subject units required or recommended for admission to all but the most selective colleges in the country. Yet, less than five per cent of the sample students entered this group of colleges. The conclusion was drawn that the college preparatory program of studies in the schools from which the sample students were drawn could be more flexible in terms of the number and distribution of required academic subjects and still meet or exceed the number of specified subject units required or recommended for entrance to most of the colleges for which the students were preparing. This increased flexibility would provide more opportunity for college preparatory students to elect subjects such as the arts which are not directly related to the college goals of most students. Recommendations based on the findings of the study were made for arts educators, administrators and guidance officials in the schools from which the sample students were drawn and for additional related research.

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CHAPTER I

INTRODUCTION

I. NATURE AND PURPOSE OF THE STUDY

This study provides a descriptive analysis of certain factors associated with the program of studies and academic achievement of selected college preparatory students who attended three senior high schools in Harford County, Maryland, during the period beginning in September of 1959 and ending in June of 1967. Special emphasis is placed upon a comparison of students with high enrollment in high school arts subjects with other students on the basis of data available from high school and college records.

The population sample for the study includes 944 students who graduated from high school in June of 1963, 1965, and 1967. All were enrolled in a well-defined program of college preparatory studies in grades nine through twelve. Follow-up information regarding collegiate programs of study and academic achievement was obtained for 364 of these students who entered college in the fall of 1963 and 1965.

The study was organized as an attempt to provide answers to questions raised by arts educators in the senior high schools of Harford County, Maryland, concerning the participation of college preparatory students in the arts curricula of these schools. After a series of discussions, these questions were consolidated into the listing presented below.

1. To what extent did college preparatory students enroll in high school arts subjects during the period 1959-1967?

2. Does the data available from high school and college records indicate that there were significant differences between students with high enrollment in arts subjects and other college preparatory students?

3. Do students with high enrollment in high school arts subjects differ from other students in their achievement in high school and college academic subjects?

4. Is there a significant relationship between the number of credits earned in high school academic subjects and college acheivement in these subjects?

5. Could students enroll in more arts subjects and still earn the number of units in academic subjects required for admission to most colleges?

Arts teachers in the three schools who participated in the study felt that data which could provide answers to at least some of these questions would be helpful to them in their efforts to encourage greater participation by college preparatory students in high school curricular offerings in music, art, and dramatics. The nature and scope of the questions outlined above indicates the feeling of these teachers that any study dealing with the participation of college preparatory students in the high school arts program must be developed within the context of the demands and purposes of the total college preparatory program of studies. The primary educational goal of these students is twofold in nature. They are preparing for admission to the college of their choice. They are also hopeful that their high school program of studies will adequately prepare them for academic success in college.

II. NEED FOR THE STUDY

The need for this study arose from the concern of arts educators in the schools involved over what appeared to them to be a trend of diminishing enrollment by college preparatory students in senior high school arts subjects. The basic concern of these teachers was the feeling that the arts were being "crowded out" of the college preparatory curriculum by pressures associated with three developments:

1. An increasing emphasis upon academic subjects, particularly those which have received heavy governmental subsidy since the enactment of the National Defense Education Act of 1958: science, mathematics, and modern foreign language.
2. Rising standards for college admission precipitated by the rapid increase in the number of students attending college, and the desire of many colleges to obtain a more selective student body.
3. The need for a more rigorous high school curriculum created by the rising academic standards in collegiate studies.

Ironically, these developments occurred at a time when arts educators in the Harford County high schools were quite interested in expanding their rather limited curricular offerings in music, art, and dramatics. It was felt that more offerings were needed to adequately serve the general educational needs of all students and to meet the specialized needs of students who were especially interested and talented in the arts.

III. CURRICULAR OFFERINGS IN THE ARTS

For the purpose of this study, the terms "curricular offerings in the arts", "arts subjects", and "arts courses" are used interchangeably. They refer to classes in the arts, including musical performance groups, which were offered as part of the regularly scheduled school day. Musical groups, art and drama clubs, and dramatic production groups which were sponsored by the school but met during a weekly activities period or before or after the regular school day were not considered in this study. With the exception of some offerings at the ninth grade level, all arts classes met five periods per week for the entire school year. Students who enrolled were given credit toward graduation for successful completion of the courses. Curricular offerings in the schools included in the study were in the areas of music, art, and dramatics.

The paragraphs which follow will be devoted to a description of the arts offerings which were available in the three study schools during the period 1959-1967 and to a discussion of the types of curricular offerings which arts educators serving these schools indicated as being desirable additions to the curriculum. This latter information was gained by the author in a series of discussions with local arts teachers conducted prior to the organization of this study.

The number and type of curricular offerings in the arts varied somewhat among the three schools included in the study. There were also some variation within individual schools during the eight-year period covered by the study.

In music, all schools scheduled at least one choral and one band group during the regular school day. Additional choral groups were scheduled as participation warranted. One school offered orchestra, in addition to band, during the entire period under study, and two band groups were scheduled by two of the schools during most of the period. General music was offered for ninth grade students in all three schools. The only other curricular offering in music was a music literature class scheduled in one of the schools during the 1966-67 school year.

Music teachers were interested in adding class lessons in vocal and instrumental music to the curriculum to provide instructional opportunities beyond those available within the framework of the rather large choral, band, and orchestral classes. There was also a desire to provide opportunities for students to participate in small instrumental and vocal ensembles during the regular school day. Many students had expressed interest in this type of experience, and various small ensembles were organized from time to time on an after-school-hours basis. The large majority of students attending the three high schools included in the study were transported to and from school by bus, and this placed limitations upon the effectiveness of this arrangement. Music teachers also expressed a desire to organize classes in music theory, history, and literature for students with an interest in pursuing music either as a vocation or as a strong avocation.

In addition to the curricular offerings described above which would give needed depth to the music program, there was a desire to add courses which would be beneficial to all students, regardless of their previous musical training or their interest or ability in the personal performance of music. Offerings in this area would be at a more mature level than ninth grade general music and would stress the development of skills in listening to music, an acquaintance with a wide variety of musical styles and forms, and an understanding of the role music plays in contemporary life and has played in other eras and other cultures.

Curricular offerings in art were limited to a general art course offered each year in each of the three schools. The courses were designed to provide students with studio experiences in a wide variety of art media. In most cases, an effort was also made to give students some understanding of the elements of design and some background in art history and appreciation. Art teachers were interested in developing separate courses in the area of art history and appreciation, both for the general student and for the prospective college art major. They were also interested in providing more opportunities for students to explore in greater depth specific art media such as sculpture, oil painting, and water color. The whole field of commercial art and design holds increasing vocational interest for many students, but little emphasis could be given in the single course offered each year for Harford County high school students.

Formal instruction in dramatics in the three study schools was provided through a combination course entitled, "Speech and Dramatics" which was offered under the auspices of the English departments. One of the schools offered a single course, and the other two schools offered a two-year sequence. The courses were designed to develop public speaking skills, provide opportunities for oral interpretation of literature, and give some experience in the preparation of dramatic productions. Some limited attention was given to the historical development of drama and the theatre. Members of the speech and drama classes often provided the nucleus of the casts and production staffs for senior class plays and other dramatic productions which were offered as extra-curricular activities. The relative emphasis placed upon public speaking and drama depended largely upon the interests and capabilities of the instructor who taught the class during a given year.

Drama teachers expressed an interest in developing courses which would provide students more opportunity to study the historical and cultural development of the various dramatic art forms, including films, radio and television, than was currently available in either the speech and drama or the English literature classes. They felt that at least one course which would include stagecraft, lighting, and production techniques would be especially helpful to students who wish to pursue dramatic activities in one form or another after graduation from high school.

Many of the understandings outlined in the preceding paragraphs as goals for additional curricular offerings within the individual arts areas could be developed within the framework of an integrated arts course. There has been much interest during the past decade in developing courses at the high school level which give students an insight into the historical and cultural development of the arts, the elements which are unique to each and common to all, and the manner in which the arts are used as a vehicle to express the spirit of contemporary life. Such courses are given various labels: "Introduction to the Arts", "Integrated Arts", or "The Arts and Humanities". Arts educators in the Harford County high schools had, during the period immediately prior to this study, expressed an interest in exploring the possibilities of offering such courses, either in lieu of or in addition to, proposed offerings within their individual subject fields.

In summary, curricular offerings in the arts in the three senior high schools included in this study were largely limited to a general course in music at the ninth grade level, chorus, band, and orchestra in grades nine through twelve, a general art course offered at each grade level, and two courses in speech and dramatics which would be taken in grades ten through twelve. This rather limited approach to the arts curriculum does not appear to be atypical of most American high schools, at least so far as music and art are concerned. The report of a national survey of public school curricular offerings and enrollment in art and music conducted under the auspices of the National Education Association in 1962 contains the following statements:

> The music program as it stood in most secondary schools appeared to be geared to the interest and abilities of students who could perform, rather than efforts to insure that every student learn something about music before he graduated from high school.[1]
>
> The art curriculum centered on general art courses. Some schools, mostly large senior high schools, offered specialized courses, but it appeared that most students who took art got only a sampling of different media. Art appreciation and art history was seldom taught as a separate course, so the student was given little feeling for art as a part of civilization.[2]

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[1] National Education Association, Research Division, Music and Art in the Public Schools (Research Monograph 1963-M3. Washington: National Education Association, August, 1963).

[2] *Ibid.*, p. 74.

Unfortunately, a search of the literature revealed no similar national study of the status of high school dramatics. However, it is interesting to note the treatment given dramatics in a bulletin issued by the Maryland State Department of Education in 1963 entitled, Policies and Programs in Secondary Education in Maryland. Dramatics is listed in the section of the bulletin devoted to English Language Arts as a possible elective offering in grades ten through twelve. It is not treated as an arts subject, and no description of possible variations of offerings under the general course heading, "dramatics", is given as is the case for music and art. Only one paragraph is devoted in the bulletin to the place of electives in the English curriculum, and this statement, quoted below, does little to bolster the cause of those who desire to strengthen the offerings in dramatics in Maryland high schools.

> No elective should be offered in any school of any size until the basic English program is planned and implemented satisfactorily and unless there is a real need for it. When choosing among electives to be offered, priority should be given to those in which students have indicated some interest and to those which can contribute directly to their control of language.[3]

Many of the students who would normally be expected to enroll in the offerings of an expanded arts curriculum are college preparatory students. In view of the current pressures associated with increased emphasis upon academic subjects and heavy competition for college admission, Harford County arts teachers were not optimistic of their chances for encouraging greater numbers of these students to enroll in arts subjects during the senior high school years. These pressures could be transitory in nature; however, they have been mounting steadily since the early 1950's and have been increased rather drastically in the wake of the agonizing reappraisal of the American educational system which followed the launching of the first Russian space vehicle in 1957. The basic problem of securing heavy involvement by college preparatory students in the high school arts curriculum is associated with two other issues which were deeply engraved in the American system of secondary school education long before either Sputnik I or the "college population explosion" arrived on the scene. These are (1) the traditional status of the arts in the high school curriculum, and (2) the priority order of curricular choice for college preparatory students. A discussion of these two factors may serve to place the problems which precipitated this study into clearer prospective.

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[3] Maryland State Department of Education, Policies and Programs: Public Secondary Education in Maryland (Maryland School Bulletin, Vol. XXXIX, No. 3. Baltimore: Maryland State Department of Education, April, 1963).

IV. CURRICULAR STATUS OF HIGH SCHOOL ARTS SUBJECTS

The arts are classified as elective subjects in most American senior high schools. Students are not normally required to earn credit in one or more of the arts as a requisite for the high school diploma. Along with such subjects as physical education, industrial arts, and home economics, the arts are also usually categorized as being non-academic. This is in contrast to the academic status accorded English, mathematics, science, social studies, and foreign language.

Few, if any, colleges list the arts among those subjects which are considered essential for admission to higher education. The arts can be further categorized as being non-college preparatory subjects for most students, since only a relatively small number plan to pursue the arts as a major area of collegiate study. The arts, then, might be described as having a triple "non" status in the curriculum of most American senior high schools. They are non-required, non-academic, and non-college preparatory. While this relatively low status in the hierarchy of high school subjects may be decried by arts educators, it is not necessarily a severe handicap to the arts program. A high school arts program which is well organized, well taught, and well conceived in terms of meeting the needs of the student body it serves can attract its share of students provided there is ample opportunity for students to select subjects on the basis of their individual interests and abilities. Unfortunately, this opportunity can, under certain conditions, become rather limited for the college preparatory student. He must satisfy a number of higher priorities which govern his choice of subjects before he is free to elect subjects solely on the basis of his individual interests and abilities. This system of priorities is discussed in the section which follows.

V. SUBJECT CHOICE PRIORITIES

The process of high school subject selection by the college preparatory student can be considered as being governed by a five-level system of priorities. These priorities are as follows:

1. Subjects required by state regulations
2. Subjects required by local regulations
3. Additional subjects required for college admission
4. Additional subjects recommended for college preparation
5. Non-college preparatory elective subjects

As can be seen from this listing, most college preparatory students must fit subjects into their program of studies each year which fall into four higher levels of priority before they are free to select subjects, such as the arts, which are neither required by state and local educational regulations nor directly related to college preparation. The discussion which follows elaborates upon this priority system and its relation to the problems which precipitated this study.

Subjects Required by State Regulations

The number and type of specific high school subjects which are mandated at the state level varies greatly throughout the country. Curricular requirements may be established by acts of state legislatures or by state boards of education. The Maryland State Department of Education outlined the curricular requirements which were in effect during the period covered by this study in its School Administrative Manual, published in 1952. This manual authorized the issuance of four types of diplomas by Maryland high schools: the Academic Diploma, General Diploma, Commercial Diploma, and Vocational Diploma. A minimum of sixteen units of credit was required of all students for graduation from high school, and specific subjects were prescribed for each of the study programs leading to the various diplomas.[4]

All students in the population sample selected for this study graduated from high school with the Academic Diploma. The vast majority of Maryland high school students who planned to attend college enrolled in the academic program. The requirements mandated by the State for the Academic Diploma are listed below:

English	4 units
Social studies	3 units

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[4] Maryland State Department of Education, Maryland's Educational Program: School Administrative Manual (Maryland School Bulletin, Vol. XXXII, No. 2. Baltimore: Maryland State Department of Education, June, 1952), pp. 49, 50.

Mathematics	2 units
Science	2 units
Foreign language	2 units
College preparatory electives	3 units
Total Prescribed Units	16

The manual specified that the three elective units should consist of "subjects commonly accepted for college entrance."[5] This requirement is open to some interpretation as far as arts subjects are concerned, but was generally construed at the local school level to refer to academic subjects.

The specification of all sixteen credits required of college preparatory students for high school graduation would appear to place Maryland among the states with the most heavily prescribed curriculum for these students during the period covered by this study. Almost without exception, however, graduates earned more than the minimum sixteen high school credits, so there was some leeway for the election of non-college preparatory subjects.

The 1952 School Administrative Manual was superceded in 1964 by the bulletin, Principles and Standards of Public Secondary Education in Maryland, also issued by the Maryland State Department of Education. This bulletin raised the minimum number of units required of all students for high school graduation to eighteen, and specified that one of these units must be in physical education. The term, College Preparatory Diploma, was substituted for the Academic Diploma and the specified subject requirements were increased in all academic subject areas except English.[6] The requirements for the College Preparatory Diploma outlined in the 1964 bulletin are listed below:

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[5] *Ibid.*, p. 50.

English	4 units	
Social studies	3 units	
Science	2-3 units	total of 5
Mathematics	2-3 units	required
Modern foreign language	3 units	
or classical foreign language	2 units	(preferably 3)
Physical education	1 unit	
College preparatory electives	2-3 units	
Total Prescribed Units	18	

The bulletin further specified that all eighteen units, with the exception of physical education, "must be of a type commonly accepted for meeting college entrance requirements."[7]

The revised graduation requirements issued in the 1964 *Principles and Standards* bulletin took effect with the class entering the ninth grade in the fall of 1965. Technically, this did not affect the students included in this study who graduated in 1963, 1965, and 1967. (The 1967 graduates entered ninth grade in the fall of 1963). However, the 1964 bulletin was the product of a rather large state-wide committee, and individual school systems were urged to react to the proposed changes well in advance of the actual publication of the bulletin. This state-wide involvement had the effect of encouraging some school administrators who "saw the handwriting on the wall" to make adjustments in local curricular requirements prior to the effective date of the revised state-wide graduation requirements.

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[6] Maryland State Department of Education, *Principles and Standards: Public Secondary Education in Maryland* (Maryland School Bulletin, Vol. XL, No. 3. Baltimore: Maryland State Department of Education, May, 1964), p. 23.

[7] *Ibid*

The 1964 Principles and Standards bulletin did have an effect upon this study in that the increased restrictions which it placed upon the college preparatory curriculum were a source of major concern to Harford County arts educators. As such, it was perhaps the principal impetus for the organization of this study. It must be noted, however, as will be indicated in the section which follows, that the additional subject requirements outlined in the 1964 bulletin merely reflected, for the most part, the established program of studies which was recommended at the local school level for college preparatory students in the senior high schools of Harford County. The fact that this program was given legal status by the Maryland State Department of Education in 1964 diminished the prospect of creating a more flexible college preparatory curriculum at the local school level.

Subjects Required by Local Regulations

Additional specific subject requirements may be imposed by local boards of education or by individual high schools. Requirements established at the individual school level in Maryland do not carry the legal authority of those imposed by local boards of education. However, high schools often list a sequence of subjects which are recommended for college preparation. If these recommendations are implemented by strong tradition and guidance procedures, they tend to carry a great deal of authority in the minds of students.

The Board of Education of Harford County imposed no requirements for the Academic Diploma in addition to those mandated by the Maryland State Department of Education during the period covered by this study. However, the individual high schools recommended through guidance procedures a sequence of subjects which should be taken at each grade level by students enrolled in the various diploma programs offered. This usually took the form of a written bulletin issued to students in the spring of each year prior to registration for the subjects they planned to take the following fall.

Table 1 outlines the program of studies recommended in April of 1963 for Academic Diploma students of Bel Air Senior High School, one of the schools from which the population for this study was drawn. This program was typical of those recommended by the three schools cooperating in this during the period 1959-1967. Some minor variations occurred from school to school and from year to year, but the general recommendation, outlined in Table 1, that

TABLE 1

RECOMMENDED PROGRAM OF STUDIES FOR ACADEMIC DIPLOMA STUDENTS OF BEL AIR SENIOR HIGH SCHOOL, 1963

Grade 9

1. English 9
2. Social Studies 9
3. General Science or Biology
4. Algebra I or Algebra II
5. Foreign Language
6. One or two electives*

Grade 10

1. English II
2. World History
3. Biology or Chemistry
4. Algebra II or Geometry
5. Foreign Language
6. One Elective

Grade 11

1. English III
2. American History
3. Chemistry or Physics
4. Geometry or Trigonometry and Algebra III
5. Foreign Language
6. One Elective

Grade 12

1. English IV
2. Problems of Democracy
3. Physics or Bio-Chemistry
4. Trigonometry and Solid Geometry or Advanced Mathematics

5 & 6. Two Electives (one of which will often be a foreign language)

Source: Bel Air Senior High School, Guidance Bulletin, March 1963

*Two electives were possible if each was offered on alternating class days. This procedure applied only at the ninth grade level.

college preparatory students earn four units each in English, social studies, science, and mathematics, and at least three units in foreign language was rather constant throughout the period. This program specifies one additional unit each in social studies and foreign language, and two additional units each in science and mathematics beyond those required for Academic Diploma graduates by the state regulations contained in the 1952 School Administrative Manual.

As was stated previously, these additional units represent a recommendation rather than a legal requirement imposed at the local high school level. This quotation from the introductory paragraph of the bulletin from which the information in Table 1 was taken indicates the strength of the recommendation: "The following is a suggested pattern of subject elections for students enrolled in the Academic Course. It is possible to make some substitutions, but the subjects suggested constitute a recommended four-year program".[8]

The number of subjects listed at each grade level in Table 1 is based upon the six-period day which was in operation in the three cooperating schools during the entire period covered by this study. With the possible exception of electives offered at the ninth grade level, classes in all subjects met daily. Thus, a student who followed this recommended program of studies precisely had only one period available for electives during the first three years of high school. Two periods were available in twelfth grade, but it was suggested that one of these periods might be devoted to an additional year of foreign language study.

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[8] Bel Air Senior High School, "Guidance Bulletin". Bel Air, Maryland: Bel Air Senior High School, March 1963. (Mimeographed), p. 1.

As will be detailed in Chapter VI, despite the fact that all students included in the sample population for this study earned the Academic Diploma, all did not follow precisely the program outlined in Table 1. Departures from the recommended program were rather limited, however. Almost without exception, all students earned four credits in English, four in social studies, and a total of at least nine credits in the areas of science, mathematics, and foreign language. In addition, most students enrolled in physical education for at least one year. Thus, seventeen units of academic subjects, plus physical education constituted the accepted minimal program for college preparation. This program corresponds closely to the revised minimal state requirements for the Academic Diploma, as set forth in the 1964 *Principals and Standards* bulletin.

Additional Subjects Required for College Admission

Certain high school subjects are traditionally accepted as basic requirements for college admission, and individual colleges may impose additional requirements.

Insofar as these requirements include subjects which are not listed as state or local requirements, they represent another group of subjects which must be fitted into the college preparatory student's schedule.

Additional Subjects Recommended for College Preparation

In the present atmosphere of heavy competition for college admission, little difference is represented by priority levels three and four. Students tend to enroll in academic subjects beyond those listed as basic college entrance requirements to provide themselves a "margin of safety". For example, a particular college catalog may list two years of high school foreign language study as a basic admission requirement. The catalog may further state that three units of foreign language study are "preferred" or "recommended". If the college is recognized as one which seeks a rather selective student body, this recommendation assumes the authority of a requirement, so far as the aspiring student is concerned. He may also be advised by parents or school guidance officials to "play it safe", and enroll in four years of foreign language. This decision can be made quite independent of the degree of interest which the student may have in the study of foreign language itself.

The college preparatory student may be advised to enroll in additional academic subjects for reasons other than that of bolstering his application for college admission. He may be told that additional course work will improve his chances for making a high score on one of the batteries of standardized college admission tests or for improving his future achievement in college studies.

Non-academic subjects, particularly typing, can also be recommended as being necessary for college success. Students planning to study engineering in college may be advised to enroll in high school drafting courses. These additional subjects, though non-academic, can be considered college preparatory and are likely to receive higher priority in the student program of studies than the arts or other elective subjects which are considered essentially non-college preparatory in nature.

College preparatory students receive information and advice regarding subjects in which they should enroll from a variety of sources. These include college catalogs, commercially published college guides, school guidance counselors, teachers, parents, older brothers and sisters, and fellow students. The validity of the advice and information received from these sources can vary greatly. _Actual_ validity matters little in the decision-making process, if the student _accepts_ the information and advice as being valid.

Non-College Preparatory Elective Subjects

The lowest priority is the level at which most students elect high school arts subjects. In Maryland, for example, there is no state requirement for the inclusion of art subjects in a student's program of studies at the senior high school level. Few local systems require enrollment in art or music beyond grade nine. Furthermore, in recent years the ninth grade requirement, particularly for college preparatory students, has tended to disappear. The relatively small group of students who plan to concentrate upon the study of one or more of the arts during college will, of course, assign high priority levels to high school arts subjects.

It must be recognized that many of the subjects which are given high priority in the system outlined in this discussion are subjects which many students, on the basis of their individual interests, would select anyway. Under a system which would allow them complete freedom of choice, many students would probably enroll in subjects which are currently required. It is not the purpose of this report to debate either the desirability or the feasibility of a system which permits college preparatory students complete freedom of choice in the selection of their program of studies. The realities of the situation are such that a hierarchy of high school subjects _does_ exist and that a rather rigid system of priorities _does_ govern the extent to which college preparatory students can elect subjects, such as the arts, solely on the basis of their individual interests and abilities.

VI. APPROACHES TO A LESS RESTRICTED CURRICULUM

There are two basic approaches to the problem of providing a less restricted curriculum for the college preparatory student. One approach is to expand the master schedule so that students can enroll in more subjects during the senior high school years. A second approach is to reduce the number of specific subjects which are either required or highly recommended for inclusion in the college preparatory course of studies. The remainder of this introductory chapter will be devoted to a discussion of these two approaches and the relationship of this study to them.

The high school master schedule can be expanded by adding more periods to the school day, by making the schedule more flexible, or by a combination of both methods. A high school schedule which is constructed around a six-period day, with all classes meeting daily for the entire school year, provides opportunity for students to enroll in twenty-four different subjects in grades nine through twelve. A seven-period day would increase the possibilities to twenty-eight subjects during the four years, and an eight period day to thirty-two subjects.

Additional opportunities for subject choice can be incorporated into a six, seven, or eight-period day by giving some degree of flexibility to the master schedule. This can be achieved by having some classes meet fewer than five times per week, by varying the length of class periods, and by offering subjects on a single semester basis. Much experimentation has taken place in recent years with high school schedules which divide the school day into modules of fifteen to twenty-five minutes each and assign varying numbers of modules to a wide variety of learning activities. Schools which use a modular approach to scheduling usually make provision for wide variations in class size and opportunities for individual study and research. While the more experimental approaches to the expansion of the high school schedule would seem to offer the best ooportunities for a broader and more effective participation in the high school arts program, any expansion beyond a rigidly constructed schedule based upon a six-period day would prove helpful.

James Conant, in his influential report, The American High School Today, recognized the limitations of the six-period day for the rigorous scholastic program he recommended for the academically talented student. His recommendation for the organization of the school day is as follows:

> The school day should be so organized that there are at least six periods in addition to the required physical education and driver education which in many states occupy at least a period each day. A seven- or eight-period day may be organized with periods as short as forty-five minutes. Under such an organization, laboratory periods as well as industrial arts courses should involve double periods.
>
> The flexibility provided by such an arrangement is to be contrasted with the rigidity of that of the

> six-period day. With a six-period day, one period of which is taken up by physical education, the academically talented student cannot elect the wide academic program recommended above and at the same time elect art, music, and practical courses. The importance of this recommendation can hardly be over emphasized in connection with the education of academically talented students.[9]

Each of the high schools included in this study employed a six-period day during the period 1959-1967. With the exception of limited flexibility at the ninth grade level and the offering of a few academic electives on a single semester basis, all classes met five times per week for the full school year. This adherence to a rigidly traditional high school schedule is not entirely due to inflexibility on the part of school administrators. The relatively minor change of adding one period to the school day creates the need for additional facilities and teaching staff. These needs would be correspondingly increased with the adoption of some of the more experimental approaches to scheduling and staff utilization. The Harford County Schools have problems in common with similar rapidly growing suburban school districts throughout the country. Facilities are becoming overcrowded, and an increasing portion of the taxpaying public is chafing under the financial burden required for the adequate support of public education. Innovations of any sort which create a need for additional teaching space and staff are not easily instituted under these conditions.

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[9] James B. Conant, The American High School Today (New York: McGraw-Hill Book Company, Inc., 1959), p. 65.

A second approach to developing a less restrictive curriculum for the college preparatory student lies in the direction of decreasing some of the various requirements which reduce his possibilities for the free election of subjects. As was stressed earlier, these requirements need not be legally imposed to have a restrictive effect. If a student, for example, feels that adequate preparation for college demands at least four units each of English, social studies, science, mathematics, and foreign language, this represents a required program of studies for him.

Most arts educators are likely to feel that they are able to exert little, if any, influence in obtaining a reduction of the specific subject requirements imposed at either the state or local levels. The possibilities for reversing the current emphasis upon heavy enrollment in academic subjects as the best preparation for college are likely to seem even more remote. Nor is the high school arts teacher likely to be optimistic concerning his chances for influencing much change in traditional approaches to scheduling the school day. The pessimism in each instance is probably well founded, so long as arts educators must rely solely upon their personal assessment of the existing situation and their own "cries of anguish" in their efforts to secure a more favorable climate for the arts in the college preparatory curriculum.

On the other hand, a greater potential for influencing change may exist if arts educators and others who are interested in providing a more balanced curriculum for the college preparatory student have information at hand which is based upon research findings. An analysis of statistics regarding student enrollment in arts subjects is necessary to validate any concern expressed by arts educators over the limitation of opportunities for college preparatory students to participate in curricular experiences in the arts. Efforts to secure a reduction in the number of required units in academic subjects is likely to be ineffective in the absence of data which show that the requirements are in excess of those necessary for admission to most colleges and, further, that there is no necessary relationship between earning a high number of units in high school academic subjects and subsequent college achievement in these subjects. If research findings should indicate that there *is* a significant relationship between the number of units earned in high school academic subjects and academic achievement in college, it would seem that, despite the monetary costs, the best possibility for providing a less restricted curriculum for the college preparatory student lies in the utilization of a more flexible approach to scheduling the senior high school day. This would allow the college preparatory student to enroll in a rigorous program of academic studies and still have time to enroll in a substantial number of non-academic electives.

This study was designed to provide the types of research information described above as it pertains to a selected sample of college preparatory students who graduated from three high schools in Harford County, Maryland.

VII. SUMMARY

This introductory chapter has provided a brief description of the nature and purpose of the study and the population sample utilized. It described the concerns of local arts educators which created the need for the research. These concerns were associated with a basic fear that the increasing emphasis upon academic subjects was limiting the extent to which college preparatory students were free to participate in curricular experiences in the arts.

The curricular offerings in the arts provided by the schools which participated in the study were described and the types of additional offerings which local arts educators felt were necessary to give needed depth and breadth to the program were discussed. The statement was made that these educators were pessimistic regarding their chances for securing much participation by college preparatory students in an expanded arts curriculum until solutions were found to some of the problems which precipitated this study.

The status of arts subjects in most American high schools was described as that of being non-academic, non-required, and non-college preparatory. This gives the arts a low priority in the program of studies for most college preparatory students who must first schedule subjects required by state and local educational regulations and any additional subjects which they feel are required for college admission and preparation before they are free to elect curricular offerings in the arts. Any change, therefore, which would result in a less restricted curriculum for the college preparatory student could provide more opportunity for him to elect arts subjects.

It was suggested that the desired flexibility in the college preparatory curriculum could come through either a decrease in the number of required academic subjects or through approaches to scheduling the school day which would permit students to carry the required academic subjects and still have time to enroll in the arts. Arts educators must have specific research information similar to that which this study was designed to provide, if they are to be influential in producing the changes which are needed to provide a less restricted program of studies for the college preparatory student.

VIII. OVERVIEW

Chapter II will define the problem in a more precise manner, indicate both the possible significance of the study and its limitations, and provide a definition of terms used. Chapter III will serve as a review of professional literature and research findings which are related to this problem. The study population and the characteristics of the schools, school system and geographical area from which it was drawn will be described in Chapter IV. Chapter V will describe the procedures used in the collection and analysis of data. The findings of the study and the conclusions drawn will be presented in Chapter VI. The concluding chapter will summarize the study and present recommendations for possible solutions to the problems raised.

CHAPTER II

THE PROBLEM

Many educators have expressed concern in recent years that the trend toward increasing emphasis upon academic subjects creates a situation which limits participation by the college-bound student in the high school arts curriculum. There has been little research to document the validity of this concern, and none has been located which focuses its attention upon the comparative academic achievement of college preparatory students with varying degrees of enrollment in the high school arts subjects.

I. STATEMENT OF THE PROBLEM

This study was designed to provide information related to the general problem of limited participation by college preparatory students in high school curricular offerings in the arts as it pertains to a selected sample of students from three high schools in Harford County, Maryland. The problem was studied in relation to the primary goals of the college-bound student: preparation for admission to college, and success in college studies.

The problem can be stated in terms of two general questions:

1. What was the status of enrollment in high school arts subjects during a period of heavy emphasis upon academic subjects, 1959-1967?

2. Is there evidence to indicate that students who elect larger numbers of high school arts subjects suffer penalties in terms of their preparation for college?

A series of additional research questions was formulated to serve as a basis for the collection and analysis of data.

II. RESEARCH QUESTIONS

The questions listed below were formulated to facilitate the development of the research design. All questions refer to the population sample drawn for this study.

1. To what extent did college preparatory students enroll in high school arts subjects during the period under study?

2. Is there evidence of a trend of diminishing enrollment in arts subjects during the period under study?

3. Do students with high enrollment in high schools arts subjects differ from other students in the variables listed below?

    a. Sex
    b. I.Q.
    c. Quintile rank in high school graduating class
    d. Grade point average in high school academic subjects
    e. Number of credits earned in high school academic subjects
    f. Total number of high school credits earned
    g. Per cent entering college
    h. Per cent withdrawing from college
    i. Selection of college fields of study
    j. Enrollment in college arts subjects

4. When I.Q. and sex variables are controlled, is there a significant relationship between level of enrollment in high school arts subjects and grade point average in high school academic subjects?

5. When I.Q. and sex variables are controlled, is there a significant relationship between level of enrollment in high school arts subjects and grade point average in college academic subjects?

6. When I.Q. and sex variables are controlled, is there a significant relationship between level of enrollment in high school academic subjects and grade point average in college academic subjects?

7. Is there evidence to indicate that high school students could enroll in more arts subjects and still earn the number of specific subject units required by most colleges with selective admission policies?

III. SIGNIFICANCE OF THE STUDY

This research will provide information which has hitherto been unavailable to the schools from which the population sample was drawn. The information should prove helpful to arts educators and officials in these schools in their efforts to ascertain the status of arts subjects in the program of studies for the college preparatory student. The study goes beyond a documentation of the extent to which college preparatory students enroll in arts subjects during a period of heavy emphasis upon academic subjects. It attempts to consider the problem of encouraging greater participation in the arts curriculum as part of the larger problem of providing opportunities for college preparatory students to receive a balanced education during the senior high school years. This, in turn, is considered within the context of the necessity for providing these students with a program of studies which will adequately prepare them for college. Because of the comprehensive nature of the approach, the results of the study could prove helpful in establishing a basis for making the types of curricular and administrative decisions which may be necessary to encourage greater participation by college preparatory students in the arts curriculum of the cooperating schools.

Although the Harford County, Maryland, high schools are most likely to benefit from this research, it has possible significance beyond the confines of the locality from which the population sample was drawn. The problem of maintaining a balanced high school curriculum has been a long-standing concern of educators; yet little research has been available which could be used as a basis for attacking the problem. Arts educators, in particular, have been highly vocal in recent years regarding the detrimental effects of curricular imbalance upon college preparatory students' participation in the high school arts program. At the same time, arts educators themselves have contributed little in the way of research findings which either lend credulity to their concern or provide support for the curricular and administrative changes which may be necessary to provide greater opportunity for college preparatory students to enroll in high school arts subjects. It is hoped that this study can make a contribution to a body of research which is much needed at this time, and that the findings can be sufficiently disseminated to encourage other arts educators to conduct similar research. The methodology developed for this study could prove helpful in this connection.

Another factor lends added significance to any research which focuses attention upon education in the arts for college preparatory students. This college-bound group will provide a major portion of the leadership for our society. From its ranks will come not only our future artistic leaders, but the business, educational, professional, and political leaders who, by their support or lack of support, will largely determine the status and role of the arts in American life.

It is interesting to note that, while many of the developments of the past decade have been viewed by arts educators as detrimental to the position of the arts in the secondary school, this same period is marked by an accelerated interest in the arts by society as a whole. This increased interest began shortly after World War II and has been popularly labeled the "cultural explosion". There has been an unprecedented growth in the rise of art galleries, community theaters, civic operas, and symphony orchestras throughout the country. Sales of recorded music, musical instruments, and art supplies have reached record highs with each passing year. Alvin Toffler, in his widely read book, The Culture Consumers, estimated that Americans spent or donated at least three billion dollars for culture in 1960, a figure that excludes public funds or business gifts. This was seventy per cent more than a comparable estimate for 1950 and was nearly four times greater than the rate of population growth during the decade.[1] The Stanford Research Institute estimated that this trend will produce a total annual expenditure in the "arts market" of seven billion dollars by 1970.[2]

Toffler summarizes this rather phenomenal development as follows:

> The American attitude toward the arts has completed a 180-degree turn since the end of World War II. From one of apathy, indifference, and even hostility, it has become one of eager, if sometimes ignorant, enthusiasm. The distance traveled, and the speed of movement, have been startling, even in an age of rapidly shifting values.[3]

Toffler does not view this expanded interest in the arts as a passing phenomenon. Rather, he sees it as a sustained trend which will move the arts into a central position in tomorrow's society.

> The cultural explosion of the past few years is the beginning, not the end, of something profound, colorful, and exciting. Nothing short of war or economic collapse can halt this progression. For in that super-industrial civilization of tomorrow, with its vast, silent, cybernetic intricacies and its liberating quantities of time for the individual, art will not be a fringe benefit for the few, but an indisposable part

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[1] Alvin Toffler, The Culture Consumers (New York: St. Martin's Press, 1964), p. 16.

[2] Stanford Research Institute, Consumer Values and Demand (Long Range Planning Service Report No. 81. Palo Alto, California: December, 1960), p. 9.

[3] Toffler, op. cit., p. 3.

> of life for the many. It will move from the edge to the nucleus of national life.[4]

In 1965 Congress enacted legislation which authorized the formation of the National Foundation of the Arts and Humanities. The appropriations supporting this act have been meager in comparison with the vast sums expended during the past decade to support the National Science Foundation and the National Defense Education Act, and only a very small portion of the available funds have been earmarked to support arts programs in the public schools. Despite these short-comings, the legislation did signify a commitment by the Federal Government to provide some support for the arts and can be taken as further evidence of an increasing national emphasis upon the arts during the period covered by this study.

In summary, this research, while designed to fill a local need, could provide some stimulation for similar research in other localities and utilizes a methodology which could be easily adapted for such studies. The fact that it focuses its attention upon the problems involved in providing curricular experiences in the arts for college preparatory students is especially significant, since from this group will come much of the leadership which will determine both the quantity and quality of arts activity in the years ahead. There is much evidence to indicate that our society is entering an era in which the arts will assume increasing importance in our national life.

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[4] *Ibid.*, p. 56.

IV. LIMITATIONS OF THE STUDY

The conclusions drawn from this study are intended to apply to the research sample only and should not be generalized to other student populations. The findings could, however, have direct implications for future student populations in the schools which cooperated in the study. The findings should be of interest, and may have indirect implications for other student populations of a similar nature. It is anticipated that the methodology developed for the study could be applied, with minor revisions, to similar studies involving a wide variety of high school and college population groups.

No attempt is made in this study to evaluate the quality of either the curricular offerings or teaching in the arts or in other subjects. Nor does the study attempt to determine the specific factors which influenced student decisions to elect or fail to elect high school arts subjects.

Data for the study were collected largely from high school records and college transcripts. Since reliable data describing the socio-economic background of students were not available from these sources, this factor was not utilized as a categorical variable in the study. It is realized, however, that socio-economic status could be a factor in interpreting the findings if a disproportionate number of students with a high level of enrollment in arts subjects tended to represent a specific socio-economic level. That liklihood of this is somewhat minimized by the fact that the population sample consisted entirely of students who were graduates of a well-defined college preparatory curriculum. The socio-economic differences within this group are not likely to be as pronounced as those within a sample drawn from a total high school population. The socio-economic differences also might have been more pronounced if the study involved only students who enrolled in one aspect of the arts curriculum. Instrumental music, for example, often requires a financial investment on the part of parents which is not necessarily required in other phases of either the arts or the general curriculum.

V. DEFINITION OF TERMS

The definitions given below will apply to terms used in this study.

Senior high school. When applied to the schools cooperating in this study, the senior high school is defined as a school organized to include grades nine through twelve. When used in a general sense, the term applied to three-year high schools (grades ten through twelve) as well as four-year high schools. (Enrollment in high school arts subjects was analyzed separately for grade nine and for grades ten through twelve so that future comparisons could be made for senior high schools organized on either a three-year or a four-year basis.)

Academic subject. Subjects which fall into the following five broad areas of the curriculum are defined as academic subjects: English, social studies, science, mathematics, and foreign language.

High school arts subject. This term applies to subjects in the areas of music, art, and dramatics which were offered in the three study schools as part of the regularly scheduled school day. This definition does not apply to arts activity groups which meet during an activity period or before or after regular school hours.

Academic Diploma. The Academic Diploma was one of four high school diplomas authorized by the Maryland State Board of Education during the period covered by this study. (The other three authorized diplomas were the General Diploma, Commercial Diploma, and Vocational Diploma.)

Academic course. This term applies to a program of college preparatory studies designed to meet the requirements for the Academic Diploma.

College preparatory student. Any student who earned the Academic Diploma is classified as a college preparatory student for the purposes of this study. (Not all students who earned this diploma attended college, and some students attended college who earned one of the other three authorized diplomas. The sample population for this study, however, consisted entirely of Academic Diploma graduates.)

Unit of Credit. The unit of credit is defined in the Maryland State Department of Education 1952 School Administration Manual as follows:

> The amount of credit earned by a regularly enrolled high school pupil for successfully completing a course covering a school year of not less than 36 weeks and offered the equivalent of five times a week in periods of not less than 45 minutes in length for all courses which assume out-of-class preparation, and for the equivalent of six times per week in periods of not less than 45 minutes in length for all courses which are exclusively laboratory and which do not assume out-of-class preparation.[5]

The 1952 School Administration Manual established standards for Maryland high schools during the period covered by this study. The Maryland definition of the high school unit of credit corresponds roughly to the Carnegie Unit which has long been the measure by which colleges evaluate high school credits in determining admission standards. However, the standard for credit in academic subjects outlined above requires at least one hundred and thirty-five class hours per year, whereas the minimum Carnegie Unit standard requires one hundred and twenty hours.[6]

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[5] Maryland State Department of Education, Maryland's Educational Program: School Administrative Manual (Maryland School Bulletin, Vol. XXXII, No. 2, Baltimore: Maryland State Department of Education, June, 1952), p. 37.

Enrollment unit. The enrollment unit is a device used in this study to measure the portion of a high school student's program of studies which was devoted to various specific subjects or subject areas. One enrollment unit was awarded for enrollment in any subject, regardless of the amount of credit the subject earned toward graduation, which met for the equivalent of five regularly scheduled class periods per week for the full school year of thirty-six weeks.

Semester hour. The semester hour is used as the measure for both enrollment and academic credit in college subjects. Quarter hours are equated with semester hours on the accepted basis of one quarter hour being equal to two-thirds of a semester hour.

Grade points. The grade point system is used as a means of expressing in numerical terms letter grades earned in both high school and college subjects. Grade points were awarded per high school unit of credit or college semester hour on the following basis: A = 4 points, B = 3 points, C = 2 points, D = 1 point, and F = 0 points.

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[6] Ellsworth Tomkins and Walter Gaumnitz, "The Carnegie Unit: Its Origin, Status and Trends", The Bulletin of the National Association of Secondary School Principals, Vol.48, No. 288, January, 1964, p. 2.

Grade point average (GPA). Grade point average is a measure of academic achievement determined by dividing the total number of grade points earned in a subject or group of subjects by the total number of units of credit attempted (high school) or by the total number of semester hours attempted (college).

High enrollment levels. The outline below indicates the basis for classifying students as having high levels of enrollment in various high school subject areas. The rationale for the classification system is discussed in Chapter V. Units earned are enrollment units for non-academic subjects and credit units for academic subjects.

Subject Area	Total Units Earned	Grade Levels
A. Non-academic		
1. Arts	3 or more[7]	10-12
2. Physical education	3 or more	10-12
3. Industrial arts	3 or more	10-12
4. Home economics	3 or more	10-12
B. Academic		
1. English	5 or more	9-12
2. Social Studies	5 or more	9-12
3. Science	4 or more	9-12
4. Mathematics	4 or more	9-12
5. Foreign language	4 or more	9-12

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[7] Arts units may be earned in a single arts subject or any combination of arts subjects.

CHAPTER III

REVIEW OF RELATED LITERATURE AND RESEARCH

A comprehensive review of professional literature revealed no studies which duplicated this research and very few which were closely related to it. Numerous articles have appeared in professional journals during the past ten to twelve years expressing the concern of both general educators and arts educators over the diminishing position of the arts in the high school curriculum during a period of heavy emphasis upon academic subjects.

Representative statements from the literature of the period will be presented in this review as a means of emphasizing the fact that the concern which prompted this research in Harford County, Maryland, is national in scope.

In general, much more effort appears to have been exerted by arts educators in decrying the presumed detrimental effects of increased academic pressures upon enrollments in high school arts subjects than has been exerted in conducting research which documents the validity of the concern and provides information which could be used in encouraging the development of a more balanced program of studies at the high school level.

Several studies were located which reported enrollment trends in high school arts subjects during the general period covered by this research. There are reviewed in this

Chapter, as are studies which surveyed high school graduation requirements imposed at the state level and specific subject requirements for entrance to colleges and universities.

Finally, several studies are reviewed which are concerned with the general problem of the relationship between specific patterns of high school preparation and subsequent academic achievement in college. This rather wide spectrum of research studies was reviewed in keeping with the general thesis of this study that the problem of limited enrollment by college preparatory students in high school arts subjects must be considered within the context of the broader problem associated with the factors which limit the extent to which these students are free to elect non-academic subjects as a significant portion of their high school programs of studies.

I. STATUS OF THE ARTS IN THE HIGH SCHOOL CURRICULUM

The American Association of School Administrators includes within its membership a large proportion of the leaders who exert considerable influence in shaping and implementing curricular policy at the state, school district, and local school levels throughout the country. Consequently, arts educators who were concerned over the status of their subject areas in the wake of the reappraisal of American public education which followed the orbiting of Russia's first space satellite in 1957, were encouraged when the AASA chose "Education and the Creative Arts" as the theme of its national convention held in February of 1959. Outstanding speakers and performers in all areas of the arts participated in the convention which passed the following resolution:

> The American Association of School Administrators commends the president, the Executive Committee, and the staff for selecting the creative arts as the general theme for the 1959 convention. We believe in a well-balanced school curriculum in which music, drama, painting, poetry, sculpture, architecture, and the like are included side by side with other important subjects such as mathematics, history, and science. It is important that pupils, as a part of general education, learn to appreciate, to understand, to create, and to criticize with discrimination those products of the mind, the voice, the hand, and the body which give dignity to the person and exalt the spirit of man.[1]

A joint statement, issued in 1965 by the American Association of School Administrators and the Music Educators National Conference, indicated the gap which often exists between official resolutions and practical actions:

> The balanced curriculum endorsed in AASA statements of 1927 and 1959 has yet to be generally adopted. Certain subjects are in a more favored position than others because of categorical aid from governmental sources and because of attitudes of legislators, lay leaders, and some state and local school authorities. These influences and attitudes are often reflected in school programs and schedules to the detriment of the arts.

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[1] American Association of School Administrators, Your AASA in 1958-59, (Official Report, American Association of School Administrators for the Year 1958. Washington: The Association, 1959), pp. 248-49.

> There is a perceptible tendency on the part of lawmakers and educational policy makers to yield to pressure groups by adding specific subject requirements in the secondary school. The effect of this is to make the curriculum less personal, directing all students toward the same academic mold. This trend should be resisted.[2]

Max Rafferty, State Superintendent of Instruction in California, in an address before California music educators in 1963, painted a rather alarming picture of the status of music in the schools of that state:

> Today it (music) is probably being taught better and more effectively than ever before in history, yet, paradoxically, never before has it been in such imminent peril of being passed over or even dropped completely from the course of study in hundreds of California schools. The reason is, of course, the new and growing emphasis upon the "cold war" subjects of science, mathematics, and foreign languages.[3]

Another West Coast educator, Angelo Giaudrone, Superintendent of Public Schools in Tacoma, Washington, in a 1962 address before Washington music educators, emphasized college entrance pressures, rather than the "cold war subjects", as a factor which worked in the detriment of the arts in secondary schools:

> ...parents and students are suffering from a "fear" virus which is so contagious its effect is devastating

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[2] Music Educators National Conference, "Music in the School Curriculum," (a joint statement of the American Association of School Administrators and the Music Educator National Conference), Music Educators Journal, Vol. 52, No. 2, (November-December, 1965), p. 37.

[3] Max Rafferty, "Trends in California Education," (an address before the Fall Conference of the California Music Educators Association, Central Section, Fresno, Calif., October 26, 1963).

> - a fear of not getting into college unless they take all the science, all the math, and three years of foreign languages, etc. For the most part these fears must be groundless if some colleges are now asking for better preparation in the humanities and have added humanities to their requirements for graduation.[4]

The National Committee on Art Education published a special edition of its publication, Newsletter in the summer of 1962 to express its deep concern over developments at that time which were felt to threaten the status of art in the public schools. The introductory statement in this publication is as follows:

> As you are no doubt aware, there has been a recent revival of emphasis on the so-called "3 R's" course of study in elementary, junior and senior high schools throughout the United States. The well known administrators responsible for this point of view insist that art in the school program is of such insignificant value as compared with other subjects that the time heretofore allotted should henceforth be radically reduced if not totally eliminated.[5]

An article appearing in the May 1964 issue of School Arts expressed through its title, "High School Dumping Grounds", the sense of frustration experienced at that time by many teachers in each of the arts areas. The author, an active high school art teacher, expressed her concern over the fact that few of the more academically able students elected art courses:

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[4] Angelo Giaudrone, "A Problem in Counterpoint," Music Educators Journal, Vol. 48, No. 6, (June-July, 1962), p. 42.

[5] National Committee on Art Education, "Are the Arts Threatened?", Newsletter, Special Edition, (Summer, 1962), p. 1.

> The demand for and income from art vocations are high but the public remains largely in ignorance of them. Consequently, when registration time comes in September, the learning-geared students, usually coming from learning-geared families, unaware of the artist's place in society and responding to the race with Russia, enroll in science and related courses. They seldom "waste their time" on Art.[6]

In 1965, Silverman and Lanier, writing in Art Education, the Sixty-Fourth Yearbook of the National Society for the Study of Education, expressed the viewpoint that the problem of providing time in the high school curriculum for art was one of long standing which was merely being accentuated by the curricular emphasis of the period:

> ...Attempts to insert art into an increasingly expanding high school curriculum, even for a minimum of twenty weeks, have met with little success. The more recent American preoccupation with science, mathematics, and foreign languages has, understandably, made success less likely.[7]

Drama teachers also expressed concern over the effect the increased emphasis upon academic subjects of the 1960's was having upon high school participation in the arts in general and in dramatics in particular. The following statement was made in the report of a national conference of drama educators and professional theatre leaders held in 1966:

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[6] Margaret Venable, "High School Dumping Grounds," School Arts, Vol. 63, No. 9 (May,1964), p. 34.

[7] Ronald Silverman and Vincent Lanier, "Art for the Adolescent," Art Education, (Sixty-fourth Yearbook of the National Society for the Study of Education, Part II, Chicago: The University of Chicago Press, 1965), p. 120.

> In nearly all ways, the position of education in the arts has been even more precarious in the secondary schools than in colleges and universities. The current class scheduling procedures of American secondary schools, joined to heavy pressure on the curriculum from the demand for more rigorous instruction in science, mathematics, the foreign languages, the social sciences, and English composition, have led increasingly to school systems in which students have little time for serious study of the arts, or serious participation in artistic creation.[8]

Two years earlier, David Sievers, a California drama educator, conducted a study of the status of drama in the high schools of that state and reported a decreasing demand for drama teachers. He attributed this to several factors:

> The lack of demand for drama teachers can be traced to a number of interrelated factors: the sudden and sometimes hysterical response to Sputnik by educators and parents who demanded academic rigor, the new and - in itself commendable - emphasis upon foreign languages, and university admission requirements which have not caught up with the new recognition of the role of the arts in liberal education.[9]

The nine references cited above are representative of the concern which was widely expressed by arts educators in professional journals during the 1960's over the status of high school arts subjects during a period in which increased emphasis was placed upon high enrollment and achievement in academic subjects.

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[8] Kenneth L. Graham (ed). "Theatre, the Schools, and Liberal Arts Colleges," Theatre Arts, Special Issue, (November, 1966), p. 56.

[9] W. David Sievers, "Status of Drama in California High Schools," Educational Theatre Journal, Vol. XVI, No. 3 (October, 1964), p. 206.

II. ENROLLMENT TRENDS

No research was located which specifically investigated trends in enrollment in high school arts subjects by college preparatory students during the period covered by this study, 1959-1967. Several studies were located which compared general student enrollments in high school arts subjects during the late 1950's and early 1960's with those of an earlier period. In each instance the researcher stated that one purpose of the study was to determine if increased emphasis upon academic subjects had had a detrimental effect on student participation in one or more of the arts.

Amend[10] compared student participation in art, music, and drama in eleven senior high schools in King County, Washington in 1959 with that of 1954. Participation was defined to include school sponsored extra-class activities in the arts areas as well as enrollment in regularly scheduled credit classes. When data for the three arts areas were combined, he reported a net decrease during the five-year period of 9.78 per cent of all students who participated in high school arts in grades ten through twelve. A majority of the principals of the schools involved in the study felt that the decrease in arts participation represented a long term trend which was due at least in part to a corresponding increasing emphasis upon academic subjects.

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[10] John Amend, "The Relative Emphasis on Academic Courses Versus the Arts and Student Activities in the High Schools of King County, Washington" (unpublished doctoral dissertation, New York University, 1961).

The Amend study, though not strictly comparable to this study, is of particular interest because it studied participation trends in all three arts areas and the setting of both studies had elements in common. King County is adjacent to Seattle, Washington. Like Harford County, Maryland, it had experienced rapid growth in population, its schools served largely middle class families, and over half of the high school graduates of the area attended college. The settings of the studies differed in that King County, Washington, was more highly urbanized and the size of its high schools was generally smaller than those in Harford County, Maryland.

Rowe[11] compared music participation for the years 1948 and 1958 in the high schools of an affluent East Coast suburban area, Fairfield, Connecticut. Here again, participation in musical activity groups, as well as regularly scheduled music classes, was included in the data. The proportion of senior high school students who participated in vocal music activities declined from 38 per cent in 1948 to 21 per cent in 1958, a 17 per cent loss. In instrumental music the loss was 5 per cent, from 11 per cent in 1948 to 6 per cent in 1958.

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[11] Robert A. Rowe, "A Study of Factors Affecting the Music Programs of Junior and Senior High Schools in Fairfield County, Connecticut" (unpublished doctoral dissertation, University of Connecticut, 1960).

The percentage of students participating in music activities was not compiled for each of the years between 1948 to 1958 to indicate a trend of net loss or gain during the decade. However, thirteen of the seventeen senior high schools cooperating in the study indicated that participation in 1958 had declined from that of the previous year. On the basis of interview results, Rowe concluded that the greatest loss in participation was among college-bound students and that increased emphasis upon academic subjects and competition for high scholastic rank within their graduating classes were significant factors in the decline in school music participation within this group. A majority of the schools reported that they had increased time allotments within the school day for English, science, mathematics, and modern foreign languages during the period between 1948 and 1958. Time allotments for music had been decreased during the period in eleven of the seventeen senior high schools.

Estes[12] studied the change of status in music education between 1955-56 and 1961-62 in fifteen Midwestern school systems, all of which were located in cities of between 50,000 and 100,000 population. He found that the average percentage of all senior high students who enrolled in music classes within these systems declined from 27.7 per cent in 1955-56 to 22.8 per cent in 1961-62. Declines in music enrollment were reported in eleven of the systems, with four systems reporting declines of more than 10 per cent of all senior high students. On the basis of interviews with school officials, Estes listed increased competition for student time, greater academic emphasis and a trend toward decreasing the periods in the school day as contributing factors.

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[12] William V. Estes, "Change in Status in Music Education between 1955-56 and 1961-62 in Public School Systems of Selected Cities between 50,000 and 100,000 Population" (unpublished doctoral dissertation, University of Illinois, 1964).

Warren[13] studied patterns of election of high school music classes by academically tallented students who graduated from Florida high schools in 1959. He found that almost half of these students elected one year of high school music in grades nine through twelve, but less than 17 per cent remained in music for as many as three years. Two-thirds of the students who discontinued music indicated the principle cause was a need or desire to take additional college preparatory classes.

The single national study conducted during this period which dealt with the status of the arts in the high school curriculum presented findings which are in marked contrast to the more localized studies reviewed above. In 1962, the Research Division of the National Education Association[14] surveyed the status of art and music in a stratified nationwide sampling of elementary and secondary schools. The study sought information regarding curricular offerings, staffing, teacher preparation, curriculum development and time allotments, as well as student enrollment data. The high school portion of the study utilized a representative sample of 948 of the estimated 24,219 schools enrolling secondary pupils during the period under study. Usable questionnaires were received from 696 or 73.4 per cent of the sample. Of these 546 were either senior high or junior-senior high schools.

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[13] John R. Warren, "Music Elections by Academically Talented Students in Florida High Schools" (unpublished doctoral dissertation, The Florida State University, 1961).

One phase of the NEA study attempted to gain some idea of enrollment trends in music and art by asking principals to indicate whether enrollment in these subjects as a per cent of the total student body had increased, decreased, or remained static between the 1956-57 and 1961-62 school years. This data for secondary schools with senior high school grades is summarized in Table 2. Slightly over 50 per cent of the schools offering music and art courses for credit reported increases in the percentage of

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[14] National Education Association, Research Division Music and Art in the Public Schools (Research Monograph 1963-M3. Washington: The Association, 1963), pp. 30-74.

TABLE 2

NATIONAL TRENDS IN MUSIC AND ART ENROLLMENT IN GRADES TEN THROUGH TWELVE AS PER CENT OF TOTAL SCHOOL ENROLLMENT FROM 1956-57 to 1961-62

Enrollment Trends	Junior-Senior High Schools		Senior High Schools	
	Music	Art	Music	Art
Per cent enrolled for credit				
Increased	53.0	51.6	53.1	54.0
Decreased	4.7	8.6	12.0	11.1
Static	26.8	35.4	26.7	30.7
Not reported	15.5	4.4	8.2	4.2
Per cent enrolled in extra-curricular activities				
Increased	54.8	43.0	51.5	39.7
Decreased	3.6	2.2	7.4	7.3
Static	20.8	37.6	29.7	42.5
Not reported	20.8	17.2	11.4	10.5
Total Schools Offering	168	93	367	287

Source: National Education Association, Research Division, *Music and Art in the Public Schools* (Research Monograph 1963-M3), 1963. Table 35, p. 35 and Table 67, p. 58.

the student body which enrolled in these courses between the 1956-57 and the 1961-62 school years. More senior high schools reported decreases in the per cent of students enrolling in music (12.0) and art (11.1) than did the combination junior-senior high schools. Of the latter group, the per cent reporting decreases in the proportion of students enrolling was 4.7 for music and 8.6 for art.

Table 2 also indicates pretty much the same trend in the percentage of students enrolled in extra-curricular music and art activities. Again, slightly over half of the schools reported that the proportion of students who participated in music activities increased between the 1956-57 and 1961-62 school years, while around 40 per cent indicated similar increases in participation in art activities. Slightly over 7 per cent of the senior high schools reported decreased proportionate enrollment in both music and art activities. Of the junior-senior high schools, only 3.6 per cent reported decreases in music activities and 2.2 per cent reported a decreased proportion of students enrolled in art activities.

The findings of the 1962 NEA study do not support the concern expressed by many music and arts educators that the increased emphasis upon academic subjects in the immediate post-Sputnik years created a situation which was detrimental to enrollment in arts subjects at the senior high school level. Several factors should be noted, however, in evaluating the results of the study. First, enrollment trends in music and art were reported as estimates by principals, and no supporting statistical data were required. This was probably the only practical way to gain evidence of trend on a nationwide basis. Second, though the sampling of schools to which the questionnaire was sent was rather small (948, or slightly less than 4 per cent of a total of 24,219 schools), a fairly high proportion (26.6 per cent) did not return usable questionnaires. Further, as can be seen by referring to Table 2, from 4.4 to 20.8 per cent of the replying junior-senior or senior high school principals did not answer the various questions related to the five-year trend in enrollments. Finally, the NEA study did not provide information concerning trends in senior high school enrollment in music and art by college preparatory students only.

III. HIGH SCHOOL GRADUATION REQUIREMENTS

Five priority levels governing the choice of high school subjects for the college preparatory student were outlined in Chapter I. The two top priority levels were assigned to those subjects which were required for high school graduation by either state or local educational regulatory bodies. Thus, the degree to which state and local requirements restrict the free election of high school subjects is directly related to the degree to which students can enroll in such subjects as the arts which are normally not required for graduation. Studies by Wright[15] and Artac[16] surveyed state requirements for graduation from high school, and both researchers noted a trend over the past several decades toward increasing both the total number of units required for graduation and the number of specific subject units within the total. Both of the studies placed Maryland in a group of five or six states with the highest number of specified subject units.

The survey reported by Wright was conducted by the U. S. Office of Education in 1955 and the findings were compared with those of a similar study conducted by Keesecker and Ward[17] in 1932. While many states allowed students to graduate with as few as fifteen credits in 1932, by 1955 all but three states required at least sixteen units. Maryland was one of five states in 1955 which required seventeen or more units, including physical education. In 1932, fourteen states failed to prescribe specific subjects which must be studied by all students prior to graduation from high school. By 1955, all but five states prescribed specific subjects for all high school graduates.

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[15] Grace A. Wright, High School Graduation Requirements Established by State Departments of Education, (United States Office of Education, Circular No. 455 Washington: Government Printing Office, 1955).

[16] Eugene J. Artac, "State Control of the Public Secondary Curriculum for 1945-1961" (unpublished doctoral dissertation, University of Pittsburgh, 1963).

[17] Ward N. Keesecker and Franklin C. Sewell, Legal and Regulatory Provisions Affecting Secondary Education, (United States Office of Education, Bulletin No. 17 Washington: Government Printing Office, 1932).

During the period 1932-1955, there were some shifts in the type of subjects required. States tended to increase their emphasis upon social studies and physical education and reduce or eliminate general requirements in science and mathematics. More states reduced the English requirement from four to three units than increased it from three units to four. While three states listed foreign language as a general requirement for high school graduation in 1932, no such requirement of all students was made by any state in 1955.

In 1955, ten states allowed almost complete freedom of choice of high school subjects, so far as regulation at the state level was concerned. At the opposite extreme, five states, one of which was Maryland, allowed opportunity for only five or six electives within the total number of units required for graduation. In thirty-six states, so far as the state department of education was concerned, students could elect eight or nine of the total units required for graduation. In a summary of the 1955 survey, Wright stated that:

> In general, state departments of education do not crowd the pupil's program with specifications to the extent that he is unable to take the elective courses

> he desires without increasing the total number of units of high school work beyond 16, or whatever minimum his particular state prescribes.[18]

The study reported by Wright covered a period ending just prior to the changes in curricular emphasis which were ushered in with the advent of the Russian exploration of space. Artac's study was concerned with state control of secondary school curriculum from 1945 to 1961 and revealed some of the trends which developed in the early post-Sputnik era. In 1961, there were still five states with no regulations pertaining to units or subjects that a student must pass for graduation from high school. Maryland was one of six states which specified as many as ten of the subject units required for graduation. During the last six years, 1953 to 1961, of the period studied by Artac, the total number of Carnegie units required by states increased from 28.5 to 40 in mathematics and from 32 to 41 in science. In addition, five states had enacted increased subject requirements which were to be phased in after 1961. Artac commented upon this trend as follows:

> The curriculum maker may find it exceedingly difficult to adjust the program of studies to recognize individual differences in interest, abilities and needs. if subject requirements for high school graduation and the number of units of required subjects continue to increase.[19]

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[18] Grace A. Wright, "Trends in High School Education Requirements at the State Level," The School Review, Vol. LXIV, No. 4 (April, 1956), p. 179.

[19] Artac, op. cit., p. 157.

The studies by Wright and Artac dealt exclusively with curricular requirements which were mandated at the state level. The unit totals listed were those required for all high school graduates, although both studies mentioned the fact that some states had additional requirements for students who were preparing to attend college. In 1959, the Research Division of the National Education Association[20] conducted a survey of high school graduation requirements which reflected those mandated at the local school level and also the diversification of requirements in accordance with the post-secondary school goals of students. The survey included a nationwide sample of 866 high schools stratified by size and reported graduation requirements for the 1958-59 school year. In a summary of the N.E.A. study,[21] it was reported that just over 20 per cent of the high schools included in the N.E.A. survey offered more than one course of study. However, 37.1 per cent of the schools with 1,000 or more pupils offered a college preparatory course which was categorized as the Academic course for the purpose of the survey. The average number of units required for graduation from the Academic course was 16.6 units, with 13.2 of these in specified subject fields. Average unit requirements in academic subjects were 3.8 units of English, 2.6 units of social studies, 2.4 units of mathematics, 2.2 units of science and 2.1 units of foreign language.

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[20] National Education Association, Research Division, High School Diplomas and Graduation Requirements (Research Memo 1959-27. Washington: The Association, 1959).

[21] ______, "High School Graduation Requirements," N.E.A. Research Bulletin, Vol. 37, No. 4 (December, 1959), pp. 121-125.

The average Academic course requirements reported in the 1959 N.E.A. survey compare rather closely with the requirements for the Maryland Academic Diploma described in Chapter I. These requirements were in effect in 1959 and throughout the period covered by this study, and called for a total of sixteen high school units, not including physical education. Thirteen of these units were in specified subjects. However, the three elective units had to be earned in college preparatory subjects. Thus, it would appear that the requirements for the Maryland Academic Diploma were somewhat more restrictive than the average requirements for graduation from an academic course of study in the high schools included in the 1959 N.E.A. survey.

In Maryland, legal authority to impose graduation requirements beyond those mandated at state level is reserved for county boards of education and is not available to the local high schools.[22] However, as was indicated in

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[22] Maryland State Department of Education, The Public School Laws of Maryland (Maryland School Bulletin Vol. XLI, No. 1, Baltimore: Maryland State Department of Education, May, 1965), p. 426 (Art. 77, Sect. 61).

Chapter I, the local school can recommend programs of study which may, in the minds of most students, have the force of legal mandate. With almost no exceptions, the students included in this study earned at least four units each in English and social studies and three units each in science, mathematics and foreign language. These units can be viewed as the acceptable minimums or local school "requirements" for graduation from the Academic course of study in the three high schools included in this study. As such, they represent a more restrictive set of requirements than was generally imposed by the schools surveyed in the 1959 N.E.A. study.

The N.E.A. study included the following statement regarding the relative merits of single and multiple courses of study:

> A school with a single course of study, with a minimum of specific requirements and a broad curriculum from which to choose elective subjects, may actually fulfill the needs and interests of individual students more satisfactorily than a school with multiple courses that are too rigid and specific.[23]

IV. COLLEGE ENTRANCE REQUIREMENTS

The extent to which colleges specify high school subjects as a condition of admission was of interest in this study, since these requirements, along with state and local graduation requirements, limit the freedom of the college preparatory student to elect subjects such as the arts which are not normally required for graduation from high school or admission to college. Several studies give evidence of a trend of increasing flexibility in college entrance requirements during the thirty-year period between 1920 and 1950.

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[23] N.E.A. Research Bulletin, op. cit., p. 122.

Benjamin Fine[24] surveyed the admission policies and requirements of 650 colleges and universities in 1945. He found that the pattern of courses required by the majority of colleges consisted of four units of English, one unit each of social science and natural science, and two units each of mathematics and foreign language, making a total of ten specified academic units. In comparing these requirements with those of twenty-five years earlier, Fine concluded that, while most colleges still required preparation in the traditional academic subjects, they were becoming more liberal in the choice of subjects permitted and that foreign languages were receiving less emphasis as a prerequisite for college admission. Tomilson[25] compared the entrance requirements of 318 colleges in 1944 with those of 1932. He noted a trend away from the earlier standard of fifteen academic units for college admission. Forty per cent of the colleges had become more liberal in their requirements, 18 per cent had become less liberal, and 42 per cent had made no changes. Tomilson also found that the number of colleges requiring foreign languages dropped from 189 of the 318 colleges in 1932 to 130 of these colleges in 1944.

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[24] Benjamin Fine, Admission to American Colleges (New York: Harper and Brothers, 1964).

[25] Lawrence E. Tomilson, "College Entrance Requirements," Educational Studies, Portland, Oregon: 1944, p. 39.

Harringer[26] compared the 1946 entrance requirements of 104 liberal arts colleges with earlier data collected by McKown[27] regarding entrance requirements of liberal arts colleges during the period 1913-1922. Harringer noted that the thirty-year period produced a steady decline in the number of specific subject units required for college admission. There was an increase in the proportion of colleges which made no requirements in one or more of the traditional academic fields. Percentages of the 104 liberal arts colleges which in 1946 made no unit requirements in the academic subject fields were 41.3 for English, 63.5 for social studies, 67.3 for science, 48.1 for mathematics, and 60.6 for foreign languages.

Harringer also surveyed the requirements of the college preparatory programs of almost 500 small high schools which sent graduates to the 104 liberal arts colleges included in his study. He found that the specific subject requirements of the high school programs were much more rigid than the entrance requirements of the colleges for which these programs were preparing students. The contrast was especially marked in the areas of mathematics in which 45 per cent of the high schools required three or four units, a number required by none of the colleges in science and by only 2 per cent of the colleges in mathematics. He concluded that, "Most high schools seem to prepare for any college, rather than prepare a given pupil for a given college."[28] Harringer also found that colleges were increasing attention to non-intellectual factors in considering candidates for admission. In view of his findings, he made the following recommendations for liberalizing the college preparatory curriculum of the secondary school:

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[26] Guy N. Harringer, "The College Preparatory Curriculum as an Instrument of Educational Guidance," The School Review, Vol. LVI (March, 1948), pp. 163-167.

[27] Harry C. McKown, The Trend of College Entrance Requirements, 1913-1922, (United States Bureau of Education Bulletin, No. 35. Washington: Government Printing Office, 1924).

> To eradicate the unworthy distinctions between academic and nonacademic subjects, both high-school and college officials should be publicizing the increasingly liberal and non-discriminatory character of college entrance requirements. In this manner all subject matter that is useful for social living would receive its due measure of credit. The college preparatory curriculum should be abolished because it is too coarse an instrument to perform the guidance service for which it is intended. Each pupil, upon selecting the institution that he plans to attend, should be counseled adequately so that he will be able to prepare himself for the specific college entrance requirements and,

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[28] Harringer, op. cit., p. 166.

at the same time, prepare himself adequately for social living.[29]

Mumma[30] compared the 1949 entrance requirements of 93 colleges belonging to the College Entrance Examination Board with those of 1939. He found that specific subject requirements became considerably more flexible during the decade and that there was a decrease in the number of foreign language units demanded by the member colleges. Noting that the C.E.E.B. colleges included "many of the oldest and most respected institutions in the country," Mumma found that:

> Two-thirds of the colleges in the College Entrance Examination Board either do not prescribe a set pattern of courses or permit exceptions in those they require or recommend. Others prescribe approximately half the secondary program and permit much freedom in the remainder.[31]

Emanuel[32] compared the 1950 entrance requirements of 138 liberal arts colleges with those of 1940. He found that during the period 16 per cent of the colleges had completely abolished specific subject requirements, an additional 23 per cent had lowered specific subject requirement in one or more fields, 8 per cent had raised entrance standards and 41 per cent had made no change.

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[29] Ibid., p. 167.

[30] Richard A. Mumma, "Further Modifications in College Entrance Requirements," The School Review, Vol. LVIII, No. 1 (January, 1950), pp. 24-28.

[31] Ibid., p. 28.

[32] William H. Emanuel, "College Entrance Requirements Ten Years After the Eight-Year Study." The School Review, Vol. LXI, No. 12, (December, 1953), pp. 521-526.

A 1964 report of the Committee on School and College Relations[33] contrasted several aspects of the admission procedures of 500 colleges in 1953 with those of 1963. Trends noted during the period were an increasing emphasis upon consideration of the personal qualities of applicants and the use of standardized college ability tests. Most of the colleges indicated they had a fixed pattern of secondary school requirements, and the authors noted that trends toward changes were hard to discern. Thus, it would appear that the long term trend toward liberalization of college entrance requirements which began in the 1920's and gathered momentum during the 1930's and early 1940's did not necessarily extend into the 1950's and early 1960's.

In 1967, Clark and Gelatt[34] reported the results of an investigation of the number and types of academic subject units earned by 278 graduates of a high school in Palo Alto, California, and the entrance requirements of 62 colleges which accepted these students for admission. They found that, while entrance requirements varied greatly among the colleges, it was possible to categorize the colleges into three levels according to the number of college preparatory subjects units required for admission. Furthermore, these categories correlated very closely with three categories arranged by the level of high school academic average which the college used as a basis for admission. Thus, colleges which required the highest number of academic subject units also accepted only those students with the highest grade point averages. The study indicated that most of the Palo Alto students enrolled in many more college preparatory subjects than were needed to meet the requirements of the colleges which accepted them for admission. High school grade point averages indicated that a sizable proportion of the students lacked ability to cope with so heavy a load of college preparatory subjects. The authors expressed concern over the long-range effects upon the students:

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[33] Committee on School and College Regulations, _Admission to American Colleges: Summary of Policies and Procedures_ (Sixth Report, New York: Educational Records Bureau, 1964).

[34] R.B.Clark and H.B.Gelatt, "Predicting Units Needed for College Entrance," _Personnel and Guidance Journal_ Vol. 46, No. 3, (November, 1967), pp. 275-282.

> Rigidly adhering to a stiff sequence of college preparatory courses may, for someone who is an average or below-average student, result in grades low enough to preclude his admission to all but the least selective colleges. Furthermore, it may prevent him from exploring other areas of interest and may lead to unnecessary experiences of failure with long-range motivational consequences.[35]

Despite the fact that 87 per cent of the students included in the study entered college the fall after graduating from high school, the authors indicated the need for a wide variety of curricular offerings in high school:

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[35] *Ibid.*, p. 276.

> The great differences among the colleges attended by the Palo Alto graduates with regard to the sequences of high school courses required for entrance indicated very clearly that the distinction between college preparatory and non-college preparatory is not very useful and perhaps quite misleading when applied to Palo Alto students.[36]

Thus, Clark and Gelatt expressed the same reservations as had Harringer twenty years earlier regarding the suitability of a rigidly constructed college preparatory program of study as an instrument of educational guidance.

As part of their study, Clark and Gelatt developed a procedure for using ninth grade academic grade point averages and intelligence test scores to predict the total grade point average for the four years of high school. They found that the predicted GPA's corresponded very closely to actual GPA's and could be used to predict the level of selectivity of the college for which the student would most likely be eligible upon graduation from high school. This information could then be used to advise the student at an early stage in his high school career regarding the specific subjects which he would need for college admission. Although the procedures used for classifying colleges by admission requirements and for predicting total high school academic achievement on the basis of ninth grade data were designed to fit the needs of a specific high school district in California, the authors felt that these could be adapted for similar purposes in other areas.

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[36] *Ibid.*, p. 281.

V. RELATIONSHIPS BETWEEN HIGH SCHOOL PROGRAM OF STUDIES AND COLLEGE ACHIEVEMENT

College preparatory students often enroll in academic subjects beyond those required for graduation from high school or admission to college on the assumption that the extra subjects will increase their probability for academic success in college. The validity of this assumption is important to this study, since the additional academic subjects are often taken in place of the arts or other so-called non-academic and non-college preparatory subjects.

A review of the literature dealing with college achievement reveals that the most interest in the relationship between patterns of high school studies and subsequent success in college occurred between 1920 and 1940. After 1940, the emphasis shifted toward the prediction of college achievement through the use of a wide variety of both intellective and non-intellective predictor variables. In the late 1950's there was some resurgence of interest in the effect of the pattern of high school program of studies upon acheivement in college. This was possibly brought about by the increasing pressures for academic excellence which were mounting at this time at both the secondary school and college levels.

The Eight-Year Study,[37] conducted from 1932-40 under the auspices of the Progressive Education Association, represented the most ambitious undertaking during the period in the field. Some 300 American colleges and universities agreed in advance to accept graduates of thirty high schools solely upon the recommendation of the school principal. All the usual requirements regarding high school course of study and specific subject units were waived for the graduates of these schools. This arrangement enabled the thirty schools to experiment with new approaches to teaching and curriculum design without fear of jeopardizing the college admission chances for their students.

An intensive study was made of 2,108 graduates of the thirty schools, and 1,475 of these students were matched with graduates of conventional high schools on the basis of scholastic aptitude, interests and socio-economic backgrounds. Comparisons were made between the two groups regarding their academic achievement, personal and psychological characterestics, participation in campus activities, and a number of other items, totaling sixty in all. Data were collected from official college records, through personal interviews with the students themselves, through questionnaires, and through reports of faculty members and college officials.

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[37] Willard M. Aiken, The Story of the Eight-Year Study, (Vol. I of Adventures in Education, 5 Vols., New York: Harper and Brothers, 1942).

The results of the Eight Year Study[38] indicated that students from the experimental schools earned a slightly higher total grade average and earned higher grade averages in all subject fields except foreign language. They specialized in the same academic fields as the comparison students, received more academic honors and participated somewhat more frequently and more often enjoyed appreciative experiments in the arts. Chamberlain, in the report summary, made the following statements:

> These students--especially the ones having the most deviate courses--have done better in college than conventionally trained students. It follows that when the secondary school program is adapted to the needs of students, and gives ample opportunity for the development of their various potentialities, the probability of success in college is enhanced. It has long been thought that a conventional college preparatory sequence was ill-suited to a majority of non-college students. The data from this study demonstrates that it is not necessarily best-suited for all those who do go on to college.[39]

The findings of the Eight-Year Study were perhaps not too surprising to those who had followed previous research in the field. Garrett[40] made the following statement regarding eight earlier studies directly related to the effect of high school pattern of studies upon academic achievement in college:

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[38] Dean Chamberlain et. al, Did They Succeed in College?, (Vol. IV of Adventures in Education, 5 Vols., New York: Harper and Brothers, 1942).

[39] Ibid., pp. 210, 211.

[40] Harley F. Garrett, "A Review and Interpretation of Investigations of Factors Related to Scholastic Success in Colleges," Journal of Experimental Education, Vol. XVII, (1949), pp. 91-138.

> These studies seem to prove conclusively that there is practically no relationship between the number or pattern of high school subjects and later college success.[41]

The results of the eight studies, conducted between 1923 and 1937, are briefly summarixed in the section which follows.

In 1923, Gebhardt[42] studied the relationship between units of high school subjects and college achievement for 217 students at the University of Colorado and concluded:

> There is no significant evidence in this investigation to show that one subject or group of subjects is of greater value in itself than any other as an aid to successful work. The evidence tends to show that two people of equal ability, studying different subjects in high school, may do college work of equal grade.[43]

Bolenbough and Proctor[44] studied the high school and college records of 716 men enrolled in Stanford University in the entering classes of 1921 and 1922. One hundred and eleven of the students were classified as vocational students in high school, having taken from 15-50 per cent of their secondary school work in vocational subjects. The remaining 605 students had the traditional college preparatory background. Each group had good high school scholarship, and each scored above fifty on the Thorndike Intelligence Test. The correlations between Thorndike score and high school scholarship indicated that the vocational students had higher achievement according to intelligence than the academic students. The high school average of the academic students correlated only .25 with their college average, while the correlation was .49 for the vocational students. The authors said:

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[41] _Ibid_., p. 99.

[42] L. Gebhardt, "Relative Values of College Entrance Subjects" (unpublished Master of Arts thesis, Colorado State Teachers College, 1923).

[43] _Ibid_., Quoted by Garrett, _op_. _cit_., p. 98.

[44] Lawrence Bolenbaugh and William Martin Proctor, Relation of the Subjects Taken in High School to Success in College," _Journal of Educational Research_, Vol. XV (February, 1927), pp. 87-92.

> Whatever the explanation, it is rather disconcerting to have the tradition that an academic pattern of high school work is a better index of college success than a vocational pattern so widely shaken.[45]

In 1923, May[46] found a correlation coefficient of .22 between number of high school credits and college grades, while five years later, Ellefson[47] found no correlation whatever. In 1933, Nelson[48] studied the records of 200 students who had completed at least three semesters at Iowa State Teachers College. He compared the College GPA of students who presented a minimum number of entrance credit in each academic field with that of students who presented additional units. He also determined the correlation between the amount of entrance credit in a given field and scholarship for the first year of college. Foreign language was the only subject field in which students who presented the larger amount of credit excelled over those presenting the smaller amount. The highest correlation found between amount of entrance credit and first year college grades was .39 for foreign language, and several negative correlations appeared.

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[45] Ibid., p. 91.

[46] Mark A. May, "Predicting Academic Success." Journal of Education Psychology, Vol. XIV (1923), pp. 429-440.

[47] E.T.Ellefson, "Predicting College Freshman Scholarship," California Quarterly of Secondary Education, Vol.III (January, 1928), pp. 179-185.

[48] M.J.Nelson,"Educational Research and Statistics: A Study in the Value of Entrance Requirements at Iowa State Teachers College," School and Society, Vol. 37 (1933), pp. 262-264.

Douglas[49] conducted a study in 1931 of the records of 1,196 students at the University of Oregon. One phase of the research correlated college achievement with number of high school units taken in academic subjects when intelligence was held constant. He concluded that:

> The number of units taken in any subject matter field does not furnish any useful basis for predicting college success, all coefficients excepting that in foreign language being practically zero, and that exception (.17) not being sufficiently great to be of any significance.[50]

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[49] Harl R. Douglas, "The Relation of High School Preparation and Certain Other Factors to Academic Success at the University of Oregon," University of Oregon Publication, Education Series III, (September, 1931).

[50] Ibid., p. 13.

In 1932, Friedman[51] found no significant relationship between number of units earned in high school social studies and history and college grade point average in these subjects at the University of Minnesota. In a 1934 University of Wyoming study, Byrns and Henmon[52] were particularity interested in the effect of high school mathematics and foreign language upon college grade point average in academic subjects. The records of 687 college seniors were analyzed and, when intelligence as measured by the Ohio State Psychological Test was controlled, no significant correlations were found between number of units earned in high school mathematics and foreign language and college grade point average in academic subjects. In discussing this finding, Byrns and Henmon observed:

> The pramatic sanction may justify the belief that foreign languages and mathematics are valuable instruments of instruction, but the evidence does not indicate that they are sacrosanct. They have probably been valued out of proportion to their significance for success in college. Their prominence both in high school curriculum and in college entrance requirements must be justified on some grounds other than mental training, for the facts seem to show that these subjects

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[51] Kopple Friedman, "The Relation of Certain Factors to Achievement in College Social Studies and History." (unpublished Masters degree thesis, University of Minnesota, 1932).

[52] Ruth Byrns and V. A. C. Henmon, "Educational Research and Statistics: Entrance Requirements and College Success," School and Society, Vol. 42 (1935), pp. 101-104.

> do not develop a student's capacity for successful college work.[53]

At least two authors, in addition to Garrett, summarized earlier research in the field and drew similar conclusions regarding the lack of strong positive relationships between the two variables. In 1945, Leonard, in an article entitled, "Can We Face the Evidence on College Entrance Requirements?", concluded:

> Clearly the assumption that college success depends upon pursuing prescribed subjects in high school cannot any longer be accepted by thinking people.[54]

Five years later, Vaughan, in an article entitled, "Are Academic Subjects in High School the Most Desirable Preparation for College Entrance?", stated a similar conclusion:

> To date we have found no study that supports the thesis that so called "Academic" subjects contribute a "significantly" better preparation for entrance to college than the non-academic subjects.[55]

The Eight-Year Study was concluded in 1940 and the report of the college follow-up portion of the study was published in 1942. For over a decade thereafter, apparently very little research was concerned with the relationship between pattern of high school studies and subsequent achievement in college. A number of studies related to the problem were reported between 1950 and 1957. Krubeck[56] studied the relationship between number of units taken in high school mathematics, science, English and industrial arts and grades in engineering college. He found low correlations between number of units in the high school subjects and engineering grades which indicated little, if any relationship existed. In a study conducted at Washburn Municipal University, Seigle[57] found that the number of units of high school mathematics taken by the student seemed to have little effect upon success in college mathematics past the first collegiate course.

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[53] Ibid., p. 104.

[54] Paul T. Leonard, "Can We Face the Evidence on College Entrance Requirements?", The School Review, Vol. LIII, No. 6, (June, 1945), pp. 327-335.

[55] William Hutchinson Vaughan, "Are Academic Subjects in High School the Most Desirable Preparation for College Entrance?", Peabody Journal of Education, Vol. 25, (1947), pp. 94-99.

In 1958, Gilbert[58] reported the results of a study of the relationship between pattern of high school studies and achievement at the University of Nebraska. He found that among students in the college of arts and science at the University those who had less than two years of college credit and had taken at least two years of high school foreign language made significantly higher grades in college than those who had not. The relationship did not hold past the second year of college, however. Waggoner[59] found no significant relationships between number and type of high school mathematics earned in high school and subsequent academic achievement of students in the College of Education of the University of Wyoming. Melton[60] studied the relationships between pattern of high school studies and academic achievement at the University of Georgia in 1958. He found little evidence of positive relationships and concluded that specific patterns of high school courses were not necessary for academic success at the University unless it altered its current expectations and methods.

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[56] F. E. Krubeck, "Relation of Units Taken and Marks Earned in High School Subjects to Achievement in the Engineering College," (unpublished Doctoral dissertation, University of Missouri, 1951).

[57] William F. Seigle, "Prediction of Success in College Mathematics at Washburn University," Journal of Educational Research, Vol. XLVII (April, 1954), pp. 557-88.

[58] A. C. F. Gilbert, "High School Experiences and College Achievement," Psychological Newsletter, Vol. 10 (1958), p. 56-64.

Sharp[61] studied the relationships between high school subject patterns, scores on the "Florida State-Wide Twelfth Grade Placement Tests," and first year college grades for

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[59] W. Waggoner, "High School Mathematics and Success in a College of Education," School Science and Mathematics, Vol. 58 (1958), pp. 650-654.

[60] C. Y. Melton, "The Academic Achievement of University of Georgia Students as Related to High School Course Patterns," (unpublished doctoral dissertation, University of Georgia, 1961).

[61] Bert L. Sharp, "High School Academic Experiences, College Placement Test Scores and College Achievement," (unpublished doctoral dissertation, University of Florida, 1960).

395 students in the 1958-59 freshman class of the University of Florida. When high school ninth grade marks were used as controls, there was a positive relationship between number of years studied and placement test scores for science and mathematics. No such relationship existed for English, and the results were mixed for social studies. Students who took two years of high school social studies scored higher on the social studies placement test than those with three years of high school study. However, students with four years of social studies in high school scored higher than those with either two or three years. When placement test scores were used as controls, no significant relationships were found between the number of high school units earned in the four academic subject areas (foreign language was not included in the study) and first year college grades in these subjects. Sharp also noted that high school students who took more units in one academic subject area generally took additional units in the other three areas as well. He concluded that:

> The results of this study suggest that amount of study measured in years that a student takes in a particular subject has no significant effect or direct bearing upon the grade the student makes in that subject in college, except as that effect is reflected by the appropriate placement test score.[62]

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[62] *Ibid.*, p. 59.

Gallant[63] studied the relationships between academic achievement of 633 freshmen at Kent State College and Ashland College in 1960-61 and selected aspects of the student's background. The study population was split into three ability groupings on the basis of SAT scores. For students of below average ability there appeared to be a positive relationship between the number of high school units taken in mathematics, science, and foreign language and first year college grade point average. For students of average ability, the only relationship which existed was an inverse one between number of units earned in foreign language and college GPA. For students with high ability, the opposite effect was found. At this level the single relationship found was a positive one between number of years of high school foreign language and freshman GPA in college. Gallant found that students with high ability tended to take more high school units in science, mathematics and foreign language than other students. He also noted that the mean first year college GPA was .29 higher for women students than for men students.

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[63] Thomas F. Gallant, "Achademic Achievement of College Freshmen and its Relationship to Selected Aspects of the Student's Background," (unpublished doctoral dissertation, Western Reserve University, 1965).

In 1963, Kennedy[64] reported that differences in pattern of high school subjects studied had no significant effect upon academic achievement in an undergraduate college of business. In 1964, Naibert[65] reported that, under certain conditions, there was a significant positive relationship between the number of semesters of high school chemistry and grades in the first course of college chemistry. However, total grade point average in high school mathematics courses proved to be the best predictor of success in first year college chemistry.

A study by Lins, Abell, and Hutchins investigated the relative usefulness of selected variables in predicting first year academic success for 3,824 students who entered the University of Wisconsin in 1962. The strongest relationship found between number of academic units completed in high school and college GPA was a correlation of .28 for the first semester of the freshman year. This decreased markedly during the second semester. The authors included the following statements in their report:

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[64] Calvin E. Kennedy, "Differences in Academic Achievement in an Undergraduate College of Business Among Students Having Different Backgrounds of High School Preparation," (unpublished doctoral dissertation, University of Nebraska, 1963).

[65] Zane E. Naibert, "A Statistical Investigation of Factors Relating to Success in a First Course in College Chemistry," (unpublished doctoral dissertation, State University of Iows, 1964).

People interested in academic matters have long implied a relationship between rigor in terms of academics and quality of preparation. In considering the means on high school academic units presented for college entrance, the differences are not great, but the direction of the differences is opposite to that which one normally would expect.

The results of this study do not support the hypothesis that the first semester G.P.A. at the university is positively related to the rigor of the academic program pursued in high school, since university underachievers have the higher average number of academic courses taken in high school.[66]

In 1967, Ashcraft[67] reported the results of a study of the effect of high school curriculum upon academic achievement at the University of New Mexico. An initial study population of 906 students was ranked according to the percentage of their total high school program which was completed in college preparatory subjects. The top and bottom quartiles were selected from this ranking to form two study groups: one which completed at least 73 per cent of its high school work in college preparatory subjects, and another which completed no more than 59 per cent of its high school work in college preparatory subjects. Using the American College Test as a measure of ability, Ashcraft found that the group with the higher percentage of college preparatory work excelled over the other students. However, when ability was controlled by covariance, the two groups were not significantly different in college achievement. When ability was adjusted to a common mean among colleges, no significant difference in grade point average was attained by the student because of his selection of a particular college within the university. Ashcraft concludes:

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[66] Joseph L. Lins, Allan P. Abell, and H. Clifton Hutchins, "Relative Usefulness in Predicting Academic Success of the ACT, the SAT, and Some Other Variables," The Journal of Experimental Education, Vol. XXXV (1966), pp. 1-29.

[67] Marion Gilbert Ashcraft, "An Analysis of the Effect of High School Curriculum Upon College Achievement," (Las Cruces, N.M.: New Mexico State University, 1967, Mimeographed: ERIC microfiche copy No. ED 017-719).

> In summary, the data does not tend to indicate that the high school background is highly critical to college success, but tends to indicate that general intelligence and non-intellective factors are more decisive to college achievement.[68]

VI. SUMMARY

A comprehensive review of the literature revealed no studies which duplicated this research and few which were closely related to it. A number of references were located which dealt with various facets of the general problem which prompted this study--that of providing sufficient opportunity for college preparatory students to elect high school arts subjects during a period of heavy emphasis upon academic achievement.

Nine statements were presented as being representative of many which appeared in the professional literature of the period 1959-1967 expressing concern over the status of the arts in the high school curriculum. Five studies were reviewed which compared high school enrollments in one or more of the arts subjects during the late 1950's or early 1960's with those of earlier periods. All but one of these studies revealed enrollment losses during the period, with increasing emphasis upon academic subjects given as one of the reasons for the loss. It would appear, then that the concern which prompted this research was widespread rather than purely local in nature.

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[68] *Ibid.*, p. ii.

Data regarding curricular requirements for high school graduation and college admission were of interest, since these requirements are factors in determining the extent to which college preparatory students are free to elect the arts and other non-required subjects. Two studies were reviewed which indicated a continuing trend over the past three decades toward increasing high school graduation requirements at the state level. Maryland, the setting of this research, was placed among those states with the highest number of specified subjects units required for graduation from high school. One national survey of graduation requirements at the local school level indicated that the median specified subject requirement for college preparatory programs was somewhat lower in the survey schools than in the three Maryland high schools which participated in this study.

A survey of research related to college entrance requirements revealed a continuing trend toward more flexible requirements during the period 1920-1950. There was some evidence to indicate that this trend did not extend into the late 1950's and early 1960's. Comparisons of high school college preparatory program requirements and college entrance requirements indicate that the high schools generally require a more rigid academic program than is necessary to meet the entrance requirements of most colleges. Research in the field reveals an increasing tendency for colleges to take non-intellective factors into consideration and to place more emphasis upon general high school achievement and standardized measures of ability than upon specified patterns of subject preparation.

Twenty research studies were cited which explored some aspect of the relationship between pattern of high school studies and subsequent academic achievement in college. This area was pertinent to the present study, since high school students often take additional academic subjects instead of the arts and other non-college preparatory subjects on the assumption that this will strengthen their chances for academic success in college. The studies reviewed were conducted between 1920 and 1967 and utilized a wide variety of procedures and statistical techniques. There was little evidence in any of the studies to indicate a high positive correlation between number or pattern of academic subjects taken in high school and either general grade point average in college or grade point average in a specific subject area. The best possibilities for significant positive relationship between high school studies and college GPA appear to lie in the areas of foreign language and mathematics, although the research findings are mixed. Several studies indicate that the relationship between number of high school subject units and college GPA is likely to be stronger for students in the lower ability levels than for other students and that the relationship diminishes after the first or second semester of college.

The college follow-up aspect of this study differs in several respects from previous research in the field. Most other studies compared the academic achievement of students who graduated from a variety of study programs offered in many different high schools but attended a single college or university. This study utilized a population sample from three similar comprehensive high schools in a Maryland School system. All of the sample students had completed a rather rigorous college preparatory program of studies which consisted of four units each in English and social studies and, in most instances, at least three units each in science, mathematics and foreign language. College achievement comparisons were made between students who completed this basic college preparatory program and those who took additional units in one or more of the academic subject areas. Furthermore, the students in the sample attended a wide variety of colleges. In addition, this study compared the academic achievement of students with relatively high levels of enrollment in high school arts subjects with the achievement of other students in the sample.

CHAPTER IV

THE STUDY POPULATION

The basic population group for this study consisted of 944 graduates of three high schools in Harford County, Maryland, who attended senior high school during the period of 1959-1967. This group will be referred to as the High School Sample. From this group 364 students who attended college were selected to form the College Sample. This chapter will outline the criteria used in the selection of the two sample groups, indicate the relationship of these groups to the populations from which they were drawn, and provide background information regarding Harford County, Maryland, its school system, and the three high schools which cooperated in this study.

I. THE HIGH SCHOOL SAMPLE

Criteria for Selection

The following criteria were established for the selection of students included in the High School Sample:

1. Graduated from Aberdeen, Bel Air, or Edgewood High School in June of 1963, 1965, or 1967.
2. Earned the Academic Diploma.
3. Entered one of the study schools no later than tenth grade.

The schools named in the first criterion were selected from the five public senior high schools in Harford

County because each was a fairly large comprehensive high school which consistently prepared between forty and sixty per cent of its graduates for continued education beyond the secondary school level. The first criterion also defined the period of time covered by the study. It began with the entry of the 1963 graduates into the ninth grade in September of 1959 and ended with the graduation of the Class of 1967 in June of that year. The period of eight school years provided a sufficient span of time to measure some indication of trend in the enrollment of college preparatory students in high school arts subjects. As was discussed earlier, the period 1959 to 1967 was one in which secondary school education was heavily influenced by the reaction in this country to the Russian achievements in aerospace technology and a rapid rise in the number of students who prepared for and attended college.

The second criterion required that all students included in the High School Sample earn the Academic Diploma. This placed most of the college preparatory students from the three graduating classes in the sample group. While all of the students who earned the Academic Diploma did not attend college, very few who earned one of the other three diplomas (General, Commercial, or Vocational) entered an accredited degree-granting institution after graduation from high school. The second criterion also assured that all students in the High School Sample had a common basic program of studies in grades nine through twelve. This was important, since much of the emphasis in this study was placed upon the relationship between academic achievement and various patterns of high school subjects which students selected beyond those required for basic college preparation.

The third criterion required that all students in the High School Sample be enrolled continuously in one of the study schools for at least three out of their four years in senior high school. This served to provide an additional degree of homogeneity to the educational background of the High School Sample. Another important consideration in the utilization of this criterion was the fact that the I.Q. scores which were used as a measure for statistical control of academic ability in this study were provided by the "Otis Quick-Scoring Mental Ability Test". This test was administered to all tenth grade students in the public high schools of Harford County as part of the regular testing program employed in the system during the period under study. By eliminating all students from the High School Sample who entered the study schools after tenth grade, an I.Q. score derived from the same test and administered at an identical point of their high school career was available for one hundred per cent of the students in the High School Sample.

Derivation

The data which follow indicate the derivation of the High School Sample from the total number of students who graduated from the three study schools in 1963, 1965, and 1967.

1.	Number of graduates of three study schools in 1963, 1965, and 1967	2,280
2.	Number of graduates earning General, Commercial, or Vocational Diplomas	1,145
3.	Number of graduates earning Academic Diploma	1,135
4.	Number of Academic Diploma graduates who entered study schools after tenth grade	191
5.	Number of students in the High School Sample	944

The 1,135 students who earned the Academic Diploma represented almost exactly one-half (49.8 per cent) of the students in the three graduating classes included in the study. Of these, 191 or 16.8 per cent, were excluded from the High School Sample because of entry into the study schools after tenth grade. Thus, the High School Sample included 41.4 per cent of all graduates and 83.2 per cent of the Academic Diploma graduates of the three study schools for the years 1963, 1965, and 1967.

II. THE COLLEGE SAMPLE

Criteria for Selection

The following criteria were established for the selection of the 364 students from the High School Sample who were included in the College Sample:

1. Graduated from high school in June of 1963 or 1965.
2. Enrolled in either an accredited four-year degree-granting institution of higher learning or in a college transfer curriculum at Harford Junior College.
3. Were enrolled in a full-time program of studies (at least twelve semester credit hours).

It will be noted that the first criterion excluded students from the College Sample who graduated from high school in June of 1967. Most of the basic data for this study were collected in the summer of 1968. While college transcripts for one year of college work for the 1967 high school graduates would have been available at that time, the decision was made when the research was designed to collect college records on only the two earlier graduating classes for which more complete data were available. Of the 571 students in the High School Sample who graduated in 1963 and 1965, 364 met the three criteria established for the College Sample. It was felt that this was a large enough group for adequate analysis of data without including students for which transcripts covering a maximum of only two semesters of college would be available.

The second criterion was established to insure some degree of compatibility in the semester credit hour and course grade data. Students in the High School Sample who continued their education after graduation entered a wide variety of institutions, including technical schools, business schools, art institutes, and private two-year colleges. While there are difficulties involved in any comparison of the academic performance of students attending different institutions, these difficulties are likely to be less pronounced when the institutions have met the standards of the recognized regional accrediting agencies.

An exception to the limitation of college data to that supplied by four-year accredited degree-granting institutions was made for students who attended Harford Junior College. This public two-year community college, while receiving accreditation from the Maryland State Department of Education shortly after its organization in 1957, did not apply for accreditation from the Middle States Association of Colleges and Secondary Schools until the 1965-66 academic year. This was due to the fact that the regional accrediting agencies rarely evaluate community colleges before they have graduated two classes from their own separately established facilities. Harford Junior College, as is often the case with community colleges, shared the facilities of a local high school during the early stages in its development. It occupied its own separate campus in the fall of

1963, and made application for evaluation by the Middle States Association two years later. After the usual year of self-study, the College was visited by representatives of the Association during the 1966-67 academic year and received its formal accreditation in the spring of 1967.

Any study of the collegiate achievement of students graduating from the high schools of Harford County would be incomplete if it did not include students who entered Harford Junior College. During recent years, over twenty per cent of the students graduating from the public high schools of Harford County each June have entered the local community college the following fall. Only these students who were enrolled in a curriculum which prepared them for transfer to an accredited four-year college or university were included in the College Sample.

The third criterion for the College Sample required that only full-time students, those carrying at least twelve credit hours each semester, be included. It was felt that it would be difficult to compare the academic achievement of full-time college students with students who were perhaps engaged in full-time employment and were taking one or two college courses in the evening.

Derivation

The outline below shows the derivation of the College Sample from the 1944 students who comprised the High

School Sample.

1.	High School Sample	944
2.	1967 graduates	373
3.	1963 and 1965 graduates	571
4.	Reported as entering degree-granting institutions	448
5.	Did not conform to College Sample Criteria	58
6.	Unable to verify college entrance	18
7.	Possible sample	372
8.	Unable to obtain college transcripts	8
9.	College Sample	364

In January of each year, Maryland high schools are required to submit to the Maryland State Department of Education a follow-up report on students who graduated in June of the preceding year. The report lists the number of graduates continuing education or working in various occupations. The names of both students and institutions are listed for graduates who entered degree-granting colleges and universities. These reports for the 1963 and 1965 graduating classes of the three study schools provided the preliminary information needed for the determination of the students to be included in the College Sample. Of the 448 students in the High School Sample who graduated in 1963 or 1965, and were reported as having entered degree-granting institutions, 58 students did not conform to other criteria established for the College Sample. These criteria and the number of students excluded for non-conformity to each are as follows:

1.	Did not attend an accredited four-year college or Harford Junior College	34
2.	Enrolled in other than college transfer curricula at Harford Junior College	12
3.	Part-time students	12

The exclusion of these 58 students left 390 students who met all criteria established for the College Sample. Of these, there were 18 students for which the colleges in which they were reported to have enrolled had no records of actual enrollment. Originally, there were 32 students in this category, but inquiries directed to high school officials resulted in the identification of the actual institution entered by 14 of the students for which incorrect information was listed on the follow-up reports.

Of the 372 students who met all criteria for the College Sample and who could be positively identified as having entered college, transcripts of college work were obtained for all but 8 students or 2.1 per cent of the possible sample. In view of the increasing emphasis upon maintaining the confidentialness of academic records, this researcher felt extremely fortunate to have obtained 98 per cent of the college transcripts requested. The eight students for whom transcripts could not be secured either could not be located or else did not reply to two written requests for permission to obtain records of their college work.

Institutions Entered

The 364 students in the College Sample entered 16 different colleges and universities in Maryland and 89 institutions located in 28 other states and the District of Columbia. The data below show the number and per cent of the College Sample by type of institution entered.

Type of Institution	Maryland		Other States	
	No.	%	No.	%
1. Public 2-year College	127	34.9		
2. State 4-year College	44	12.1	10	2.8
3. State University	68	18.7	17	4.7
Total Public Institutions	239	65.7	27	7.5
4. Private 4-Year College	17	4.7	46	12.6
5. Private University	3	0.8	30	8.2
6. Private Music Conservatory	2	0.5	0	0.0
Total Private Institutions	22	6.0	76	20.8
7. Total - All Institutions	261	71.7	103	28.3

Over sixty per cent of the College Sample entered either Harford Junior College, The University of Maryland, or Towson State College. The number and percentage of the 364 students in the College Sample which entered these three Maryland institutions is given below.

Institution	Number	Per Cent
1. Harford Junior College	127	34.9
2. Univeristy of Maryland	68	18.7
3. Towson State College	33	9.1
Total	228	62.7

III. THE STUDY SCHOOLS

Location

Students included in the High School Sample were drawn from the following three schools: (1) Aberdeen High School, (2) Bel Air High School, and (3) Edgewood High School. The schools are named for the communities in which they are located. Aberdeen and Bel Air are incorporated towns and Edgewood is unincorporated. Each high school serves students who live in the towns, in nearby housing developments and in outlying rural areas.

Size and Organization

Table 3 shows the enrollments and organizational patterns of the three study schools during the period covered by this research. Each of the schools was organized as a junior-senior high school (grades seven through twelve)

TABLE 3

ENROLLMENT AND ORGANIZATION
OF STUDY SCHOOLS,
1959-1966

October 1 Enrollment	HIGH SCHOOLS					
	ABERDEEN		BEL AIR		EDGEWOOD	
	Students	Grades	Students	Grades	Students	Grades
1959	1,106	7-12	1,998	7-12	971	7-12
1960	1,364	7-12	2,161	7-12	1,061	7-12
1961	1,494	7-12	1,455	9-12	1,098	7-12
1962	1,595	7-12	1,573	9-12	1,128	7-12
1963	1,701	7-12	1,722	9-12	1,373	7-12
1964	1,834	7-12	1,817	9-12	1,274	8-12
1965	1,228	9-12	1,848	9-12	1,093	9-12
1966	1,420	9-12	1,908	9-12	1,271	9-12

Source: Data supplied by Board of Education of Harford County and housed in a new building during the early 1950's. This was accomplished through a program of school consolidation which enabled the Board of Education of Harford County to operate secondary schools of sufficient size to provide a comprehensive program of studies.

As the school population increased during the 1960's, new junior high schools were built to house grades seven and eight, and the three study schools became four-year senior high schools. As can be seen by referring to Table 3, this change was effected in 1961 in Bel Air, and in 1965 in Aberdeen and Edgewood.

Regardless of the particular organizational pattern which prevailed at different points during the period under study, all students in the High School Sample attended secondary schools which could be categorized as rather large high schools. The fall enrollments ranged from 971 students in Edgewood High School in 1959 to 2,161 students in Bel Air High School in 1960.

In September of 1959, the beginning of the period under study, 64.4 per cent of all students enrolled in grades nine through twelve in the public high schools of Harford County attended the three study schools. This had increased to 75.7 per cent by September of 1966, the beginning of the final school year covered by this study. Thus, the High School Sample was drawn from schools which housed a substantial majority of the senior high school students enrolled in the public schools of Harford County during the study period, 1959-67.

In addition, 74.5 per cent of all students who graduated with the Academic Diploma in 1963, 1965, and 1967 from public high schools of Harford County were graduates of the three study schools.

Comprehensiveness

Each of the three study schools could be described as being a comprehensive high school. This term is generally applied to a school which seeks to serve the varied educational needs of almost all the boys and girls of high school age within its attendance area, regardless of the academic ability, level of scholastic achievement or post-secondary school plans of the students. The comprehensive high school represents an American tradition standing in direct contrast to the European approach which segregates students of high school age into separate schools to prepare them exclusively for either university admission or entrance into various trades and vocations.

Dr. James B. Conant, in his highly influential report published in 1959, The American High School Today, focused the attention of the lay public and educators alike upon both the strengths of the comprehensive high school as an institution which prepares students to function effectively in a democratic society, and the weaknesses, in his view, of the educational programs of many such schools. He describes the objectives of the comprehensive high school as follows:

> "...the three main objectives of a comprehensive high school are: first, to provide a general education for all future citizens; second, to provide good elective programs for those who wish to use their acquired skills immediately upon graduation; third, to provide satisfactory programs for those whose vocations will depend on their subsequent education in a college or univeristy."[1]

The educational program of the three study schools reflected an acceptance of these objectives. All students were required to complete a program of general education which included four ~~units of~~ English, three in social studies, one in mathematics, and two in science. The remaining portion of each student's program of studies was determined by the particular diploma program he chose to enter.

Each of the three study schools offered programs leading to the General, Commercial, and Academic Diplomas. One school offered a program in vocational agriculture which qualified a student for the Vocational Diploma. The program of studies which led to the Commercial Diploma was designed to prepare students for entry into the business world directly after high school. Students working toward the General Diploma could choose from a wide number of electives, including commercial subjects, which could prepare them to some degree for entry into a vocation directly after graduation from high school.

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[1] James B. Conant, The American High School Today (New York: McGraw-Hill Book Company, Inc., 1959), p. 17.

As can be seen from the data in Table 4, there was a fairly even balance between students from the graduating classes included in the study who earned the Academic Diploma and those who earned the non-college preparatory diplomas. This is a further indication of the comprehensive nature of the study schools. Approximately 40 per cent of each Edgewood High School graduating class and 50 per cent of the classes graduating from the other two study schools earned the Academic Diploma.

This study was concerned with students for whom Dr. Conant's third objective, preparation for college entrance, was designed. As was stated earlier, the large majority of these students enrolled in the Academic Diploma program of studies. The requirements for this diploma were outlined in Chapter I. Each of the study schools offered a series of electives of the type advocated by Dr. Conant to challenge the capabilities of academically able students. Advanced courses in mathematics, science, English, and social studies were available. Each school offered two modern foreign languages, with three years of continuous study available in at least one. Four years of French was offered in two of the study schools.

TABLE 4

PER CENT OF GRADUATES OF STUDY SCHOOLS
BY TYPE OF DIPLOMA EARNED -
1963, 1965, and 1967

Year and Diploma	Aberdeen	Bel Air	Edgewood
1963			
Academic	53.8	50.6	40.4
General	27.3	28.4	35.6
Commercial	18.9	18.3	24.0
Vocational		2.7	
1965			
Academic	47.8	54.9	40.2
General	25.4	28.0	33.0
Commercial	26.8	15.7	26.8
Vocational		1.4	
1967			
Academic	48.6	57.9	37.4
General	30.7	23.0	35.2
Commercial	20.7	16.9	27.4
Vocational		2.2	

Source: Computed from data provided by the Board of Education of Harford County

The size of a high school is directly related to the degree to which it can effectively offer a comprehensive program of studies. This is especially true for schools desiring to offer advanced courses for academically talented students. The Conant report indicated that, "Unless a graduating class contains at least one hundred students, classes in advanced subjects and separate sections within all classes become impossible except with extravagently high costs."[2]

Table 5 gives enrollments in the twelfth grade for each of the study schools for the period covered by this research. The senior class fall enrollments were considerably higher than one hundred students each year in the Aberdeen and Bel Air schools, ranging from 134 to 438 students. The smallest of the three schools, Edgewood High, had fall senior class enrollments ranging from 99 to 247 students during the eight-year period. Thus, despite the fact that during the earlier part of the period the three study schools were organized as junior-senior high schools, the graduating classes were of sufficient size to enable them to offer a comprehensive program of studies.

The results of a second study of the American high school, directed by Dr. Conant in 1965 and 1966 and reported

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[2] Ibid., p. 77.

TABLE 5

TWELFTH GRADE ENROLLMENT IN STUDY SCHOOLS, 1959-1966

October 1 Enrollment	HIGH SCHOOLS		
	Aberdeen	Bel Air	Edgewood
1959	134	227	99
1960	146	273	129
1961	169	320	114
1962	153	267	109
1963	234	376	136
1964	272	438	174
1965	306	426	227
1966	298	435	247

Source: Data supplied by Board of Education of Harford County in his book, The Comprehensive High School,[3] indicate that the three Harford County study schools have elements in common with a large number of high schools throughout the country. The study, conducted under the auspices of the National Association of Secondary School Principals, surveyed all of the more than 18,000 public high schools who graduated a twelfth grade in 1965. Just over 15,000 or 80 per cent of these schools participated in the survey, so the results give a fairly accurate picture of some of the characteristics of American public high schools in 1965.

Approximately one-half of the nation's public high school students attended schools which Dr. Conant classified as medium-size, ranging from 750 to 2,000 students. These represented around 30 per cent of the public high schools, with 11 per cent in the 750-999 student category and 19 per cent in the 1,000-1,999 category. In a more detailed study of 2,024 of the medium-size schools, Dr. Conant found that, despite the fact that his medium-size classification covered a wide enrollment span (750 to 2,000 students), the actual size of the school within this range made little difference in the degree of comprehensiveness of the program of studies offered.[4]

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[3] James B. Conant, The Comprehensive High School (New York: McGraw-Hill Book Company, Inc., 1967), pp. 11, 12.

[4] Ibid., pp. 76-78.

In the 1965-66 study, Dr. Conant classified high schools as being "widely comprehensive" which were of medium-size (750-2,000 students), and from which between 25 and 75 per cent of the 1965 graduates continued their education. These two criteria eliminated a number of schools from the classification which have characteristics which limit their degree of comprehensiveness: namely, small rural schools, large inner-city and suburban schools of over 2,000 students, and schools, mostly in the suburbs, which traditionally prepare almost all of their graduates for college entrance.

The three Harford County schools could be classified as being widely comprehensive according to Dr. Conant's criteria. Fall enrollments in 1965 were Aberdeen High School, 1.228; Bel Air High School, 1,848; and Edgewood High School, 1,093. The percentage of 1965 graduates from each of the schools continuing education was Aberdeen High School, 54.5; Bel Air High School, 62.0; and Edgewood High School, 47.6.

Table 6 compares the percentage of students from the combined 1965 graduating classes of the three study schools who continued post-secondary school education with that of both the total number of schools participating in the Conant study and the sub-group of 1,878 medium-size schools. The percentage of graduates from the Harford County study schools who continued their education (56.8) varied only slightly from the almost identical percentages (55.6 and

TABLE 6

PER CENT OF 1965 GRADUATES CONTINUING POST-SECONDARY SCHOOL EDUCATION - THREE HARFORD COUNTY SCHOOLS AND CONANT STUDY SCHOOLS

Schools	4-Year College	Junior College	Technical and Other Schools	Total
Harford County - 3 High Schools	23.9	25.3	7.6	56.8
Conant Study - 15,069 High Schools	35.3	11.0	9.5	55.6
Conant Study - 1,878 Medium-Size High Schools	34.8	11.4	9.5	55.7

55.7) of the two groupings in the Conant study. When these total percentages are broken down by type of post-secondary institution attended, the Harford County graduates are less typical. Here the availability of a local junior college is a predominant factor. While 25 per cent of the 1965 graduates of the three Harford County high schools entered junior college, only 11 per cent did from the schools represented in the Conant study. Conversely, 35 per cent of the graduates of the Conant study schools entered four-year colleges compared to 24 per cent for the three Harford County schools. The 2 per cent differential between the Harford County schools and the Conant study schools in the percentage of 1965 graduates entering technical and other schools is also likely to be attributable to the availability of Harford Junior College which offers programs in various technical fields, business administration, advanced secretarial studies, and nursing.

In summary, the schools from which the High School Sample for this study was drawn would appear to have elements in common with a large number of American high schools in terms of size, the degree of comprehensiveness of the program of studies offered, and the percentage of graduates continuing education. The three study schools could be most closely identified with high schools which send a higher than average percentage of their graduates to junior colleges. In view of the rapid development of public two-year colleges in many parts of the country, this is likely to become an increasingly larger proportion of high schools in the future.

IV. THE HARFORD COUNTY SCHOOL SYSTEM

Organization

Maryland has a highly centralized system of public schools. There are only twenty-four school districts in the state: the Baltimore City school system and one in each of the twenty-three counties. All schools within each county, including those in the incorporated cities and towns, are under the jurisdiction of a single board of education and are administered by a single superintendent of schools. This county-unit pattern of organization made it much easier for the Harford County Board of Education to consolidate its smaller schools as the school population grew than would have been the case had there been a number of small independent school districts within the County.

Size and Growth

School enrollments in Harford County almost doubled during the decade just prior to the period covered by this study. In the fall of 1959, total enrollment stood at 15,878 pupils, compared to 8,156 in the fall of 1949. This represented an increase of 94.6 per cent and reflected the growing urbanization of the County.[5] During the period covered by this study, 1959-1967, school enrollments increased another 48.1 per cent with 23,520 pupils enrolled at the beginning of the 1966-67 school year.[6] This pattern of rapid growth is expected to continue with a public school enrollment in Harford County of 35,914 pupils projected for the fall of 1974.[7]

In recent years the Harford County school system has ranked sixth in size among the twenty-four school systems in Maryland. This places it just below the school systems of Baltimore City and the four largest counties in the Washington-Baltimore metropolitan area. In the fall of 1968, there were 28,162 pupils enrolled in the public schools of Harford County, compared to 65,920 in the fifth ranking system, Anne Arundel County, and 14,371 in Howard County, the seventh ranking system.[8] Thus, the Harford County school system, despite projections for continued rapid growth, is likely to retain its relative size position among the school systems in Maryland for some years to come. It is presently less than one-half the size of the fifth ranking system in the state and almost twice the size of the seventh.

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[5] Board of Education of Harford County, Annual Report, 1960 (Bel Air, Maryland: Board of Education of Harford County, 1960), p. 9.

[6] ______, Annual Report, 1966-67 (Bel Air, Maryland: Board of Education of Harford County, 1967), p. 10.

[7] ______, Capital Improvements Program, 1969-70 to 1973-74 (Bel Air, Maryland: Board of Education of Harford County, 1970), p. 88.

[8] Maryland State Department of Education, Facts About Maryland Schools, 1968-69 (Baltimore: Maryland State Department of Education, 1969), p. 5.

V. CHARACTERISTICS OF HARFORD COUNTY, MARYLAND

This section will provide background information concerning the geographic, population, and economic characteristics of the area from which the student sample for this study was drawn. Since the three study schools served approximately 80 per cent of both the land area and total population of Harford County, the characteristics of the County as a whole give a rather accurate description of the area and population from which the High School Sample was drawn. The two public high schools not included in this study were approximately the same size, and one served a predominately rural area, while the other served a predominately urban area of Harford County. These would appear to offset each other in terms of their representation in the characteristics of the County as a whole.

Geographic

Harford County is located in northeastern Maryland. It is bordered on the north by Pennsylvania, on the east by the Susquehanna River, on the south by the headwaters of the Chesapeake Bay, and on the west by Baltimore County.

Major highway and rail routes between New York and Washington traverse Harford County. It is located twenty miles northeast of Baltimore and sixty-five miles southwest of Philadelphia. Distances from Washington, D. C., and New York City are sixty miles and one hundred and sixty-four miles, respectively.

Population

Harford County has experienced the rapid population expansion associated with the metropolitan areas along the Atlantic Seaboard. Since 1940, the County has had close to a 50 per cent increase in population each decade, and this trend is expected to continue. (See Table 7). The population growth from 51,782 in 1950 to 76,722 in 1960 represented an increase of 48.2 per cent, compared to increases of 32.3 per cent for Maryland and 18.5 per cent for the United States.

Other statistics from the 1960 U. S. Census of Population provide insight into the characteristics of the population of Harford County. The median number of school years completed by persons over twenty-five years of age was 10.8, compared to 10.4 years for Maryland and 10.6 years for the United States. Of the Harford County residents within this same age category, 43.4 per cent had completed high school or more, compared to 40.0 per cent

TABLE 7

POPULATION CHANGES IN HARFORD COUNTY, MARYLAND 1940-1980

Year	Population	% Increase
1940	35,060	
1950	51,782	47.7
1960	76,722	48.2
1970*	115,300	48.9
1980*	172,000	49.2

Sources:	1940-1960	U. S. Census of Population
	1970-1980	(estimates) Harford County Planning and Zoning Commission

*Estimates

for Maryland and 41.1 per cent for the United States.[9] Harford County ranked third among Maryland counties in both of these measures of educational attainment. The two counties ranking ahead of Harford were Montgomery and Prince George's, both of which are adjacent to Washington, D. C., and house a substantial number of officials and employees of the Federal Government.

This relatively high level of educational attainment was reflected to some degree in the occupational distribution of the civilian population of Harford County as reported in the 1960 U. S. Census. Table 8 provides data which compares the distribution among major occupational categories in Harford County with that in both Maryland and the United States. The proportion of professional and technical workers in Harford County (13.9 per cent) was slightly higher than that for the State (13.5 per cent), which in turn was above the national figure of 11.2 per cent. There were no large variations between the proportion of Harford County workers engaged in the broad categories of white collar, blue collar, and service occupations and those reported for both Maryland and the United States. In the case of farm workers, the Harford County

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[9] United States Bureau of the Census, County and City Data Book, 1967 (Washington: Government Printing Office, 1967), pp. 170-172.

TABLE 8

COMPARISON OF PER CENT OF EMPLOYED PERSONS BY MAJOR OCCUPATION GROUPS - HARFORD COUNTY, THE STATE OF MARYLAND AND THE UNITED STATES, 1960

MAJOR OCCUPATION GROUP	PER CENT DISTRIBUTION		
	Harford County	Maryland	United States
1. WHITE COLLAR WORKERS	39.3	45.9	41.2
a. Professional and Technical	13.9	13.5	11.2
b. Managers (non-farm), officials and proprietors	7.3	8.2	8.4
c. Clerical	13.2	16.9	14.4
d. Sales	4.9	7.3	7.2
2. BLUE COLLAR WORKERS	38.8	35.4	36.7
a. Craftsmen and foremen	15.1	14.3	13.5
b. Operatives	18.7	15.8	18.4
c. Laborers (non-farm)	5.0	5.0	4.8
3. SERVICE WORKERS	9.6	10.5	11.1
a. Private household	2.6	2.7	2.7
b. Other	7.0	7.8	8.4
4. FARM WORKERS	7.7	2.9	6.1
a. Farmers and managers	3.7	1.6	3.9
b. Laborers and foremen	4.0	1.3	2.2
5. NOT REPORTED	4.6	5.6	4.9

Source: Percentages computed from United States Bureau of the Census, Eighteenth Census of the United States: 1960, Characteristics of the Population, Vol. I (Washington: Government Printing Office, 1967), Part 1, Table 206 and Part 22, Tables 52, 57, 83, and 84.

proportion (7.7 per cent) was closer to that found in the nation (6.1 per cent), but more than twice that reported for Maryland (2.9 per cent). It is interesting to note that the proportions of Harford County workers employed in white collar and blue collar occupations were almost identical at 39.3 per cent and 38.8 per cent, respectively. On the basis of the Census data presented in Table 8, it could be stated that the occupational distribution within the civilian population of Harford County in 1960 was in most respects very similar to that reported for the country as a whole.

The presence of two large military bases, Aberdeen Proving Ground and Edgewood Arsenal, is an important factor in both the population and economic characteristics of Harford County. The economic implication will be discussed in the last section of this chapter. The 1960 census numbered military personnel in Harford County at 6,349, approximately 8 per cent of the population. The Harford County Economic Development Commission estimated that military personnel accounted for approximately 10 per cent of the population in 1969 with another 7 per cent being dependents of persons stationed at the two bases.[10] On the basis of these figures, it would seem safe to assume that

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[10] Harford County Economic Development Commission, "Harford County Statistics, 1968-69" (Bel Air, Maryland: Harford County Economic Development Commission, 1969), p. 4 (Mimeographed).

that during the period covered by this study, military personnel and their families represented close to 15 per cent of the population of Harford County. This has implications in describing the background of the student population for this study, since two of the high schools included are located in communities adjacent to the two military bases.

The transientness usually associated with students from military families was not as large a factor as might be supposed, however, in the composition of the High School Sample. One of the criteria for the sample group was the stipulation that students must have been enrolled in the study schools no later than tenth grade. The nature of the two Army bases also contributed to a more stable population than is often the case in military oriented communities. Both Aberdeen Proving Ground and Edgewood Arsenal are largely devoted to research, development, testing, and technical schooling, rather than basic military training. These activities require a high ratio of commissioned officers, many of whom are trained in scientific and technical disciplines. Their tours of duty in Harford County tend to be somewhat longer than is often the case at installations which are primarily engaged in basic military training, and their presence in the County contributes to the higher than average educational level of the population. The two military bases are also characterized by a high ratio of civilian employees to military personnel. This is illustrated by the fact that in 1968 the two installations employed a total of almost 10,000 civilians and had a military complement totaling approximately 12,000 officers and enlisted men.[11]

Economic

According to the 1960 U. S. Census, the median family income in Harford County was more typical of the nation than of the State of Maryland. Median family income for the County was $5,863, compared to $5,660 for the United States and $6,309 for Maryland. Harford County ranked sixth among Maryland counties in median family income. Median income for the State was inflated by the high income families residing in the Washington, D. C., suburban counties of Montgomery and Prince George's. These reported median family incomes of $9,313 and $7,471 respectively. The proportion of Harford County families with income of $10,000 or more was 15.0 per cent; almost identical with the 15.1 per cent reported for the United States. Here again, the Maryland figure was higher with 19.8 per cent of the families reporting an income of $10,000 or more.[12]

The 1960 U. S. Census statistics represent the beginning of the period covered by this study. Comparable figures are not available for the later part of the period, but estimates prepared in 1965 indicate approximately the same relative economic position for Harford County families. These figures place the median family income in the County at $8,644, compared to $7,989 for the United States and $9,384 for Maryland. Again, as in 1960, Harford County ranked sixth among Maryland counties in median family income.[13]

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[11] Ibid.

[12] U.S.Bureau of the Census, County and City Data Book, 1967, pp. 170-172.

The Federal Government, through its two permanent U. S. Army installations, Aberdeen Proving Ground and Edgewood Arsenal, has for many years provided the backbone of the Harford County economy. This is illustrated by the fact that an estimated one-third of the County's total labor force in 1966 was employed by the United States Government.[14] In the 1967 fiscal year the combined payrolls of Aberdeen Proving Ground and Edgewood Arsenal amounted to 137.2 million dollars, or 66.4 per cent of the estimated total of 206.7 million dollars for all payrolls in the County.[15]

Increasing urbanization has resulted in a corresponding decrease in the importance of agriculture in the economic structure of Harford County. In 1940, almost three-fourths of the land area in Harford County was in farms. By 1965, this had diminished to slightly more than half.[16] About five per cent of the total labor force of the County was employed in farming in 1966.[17]

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[13] "Survey of Buying Power," Sales Management, June 10, 1966.

[14] Harford County Economic Development Commission, Harford County Industrial Corridor (Bel Air, Maryland: Harford County Economic Development Commission, 1968, pp. 13, 14.

[15] ______, "Harford County Statistics, 1968-69", p.7.

Manufacturing has increased somewhat with the growth in population in Harford County but is not yet a dominant factor in the economy. Almost seventeen per cent of the County's labor force was engaged in manufacturing in 1966, and half of this group (2,500 workers) was employed by a large shoe manufacturer. The remaining half was employed by some sixty industries scattered throughout the County.[18]

Despite the fact that much of Harford County's population and economic growth is directly related to the migration of people from Baltimore and suburbs closer to the city, the County differs from many suburban areas along the East Cost in that a relatively small portion of the work force commutes into the City. Recent estimates indicate that eighty per cent of the total work force living in Harford County is employed within the County.[19]

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[16] John W. Wysong, The Agricultural Industry in the Urban-Rural Fringe. A Case Study of Harford County, Maryland, Bulletin 479, Agricultural Experiment Station, University of Maryland (College Park: University of Maryland, June 1967), p. 1.

[17] Harford County Economic Development Commission, Harford County Industrial Corridor, p. 14.

[18] Ibid.

VI. SUMMARY

The basic population sample used in this study, termed the High School Sample, was composed of 944 graduates of three high schools located in Harford County, Maryland. All sample students earned the Academic (College Preparatory) Diploma in June of 1963, 1965, or 1967. No students were included who entered the study schools after tenth grade. The college follow-up portion of this study involved 364 students from the basic sample. This group, termed the College Sample, was composed of the 1963 and 1965 high school graduates who either entered accredited four-year degree granting institutions or were enrolled in a college transfer program at Harford Junior College. Only full-time students were included in the College Sample, and they entered 89 institutions located in 29 states and the District of Columbia. Just over 70 per cent of these students entered Maryland colleges or universities.

The three high schools from which the sample students graduated were described as being rather large, having enrollments of between one and two thousand students during the period under study. Each of the schools had a comprehensive program of studies and normally sent approximately half of its graduates into post-secondary school education.

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[19] Maryland Department of Employment Security, Harford County's Occupational Outlook (Bel Air, Maryland: Harford Junior College, December, 1969), p. 9.

The Harford County School System was characterized as one which experienced rapid growth during the period under study. It ranked sixth in size among the twenty-four school systems in Maryland and enrolled 23,520 pupils at the beginning of the 1966-67 school year. The study schools served a geographic area which was experiencing the rapid population growth which is characteristic of the metropolitan areas along the Atlantic Seaboard. The three schools drew students from rural as well as urbanized areas. The economic and educational level of the population of Harford County was described as being somewhat above the average for the country as a whole. The occupational distribution of the labor force within the County was very similar to that given for the nation in the 1960 Census of Population.

While the findings of this study cannot be generalized directly to other populations, the sample population would appear to be typical of many groups of college preparatory students throughout the country.

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CHAPTER V

PROCEDURES

This chapter will describe the procedures utilized in the collection and treatment of data. The major portion of the data was related to the programs of study and academic achievement of 944 students in the High School Sample and 364 students comprising the College Sample. An additional area of inquiry was related to the admission requirements of a selected group of colleges and universities.

I. DATA COLLECTION

The High School Sample

Basic data pertaining to the High School Sample were obtained from permanent student record cards which were made available by the three high schools cooperating in this study. Most of the information was taken from the "Maryland Achievement and Attendance Record," a standardized record form which the Maryland State Department of Education requires all public high schools to maintain for each of its students. Data obtained from this source included the following for each student in the High School Sample:

1. Year of entry into the study school
2. Subjects taken in grades nine through twelve
3. Units of credit and grades earned in academic subjects

4. Total number of units of credit earned toward graduation

5. Enrollment units earned in the arts and other non-academic subjects--computed from entries which indicated the number of weeks, periods per week, and minutes per period in which students enrolled in these subjects

6. Quintile rank in graduating class

7. I.Q.--"Otis Quick Scoring Mental Ability Test, Gamma"[1]

Scores for students who took one or both of the standardized college ability tests, "The Scholastic Aptitude Test"[2] and the "American College Test"[3] were obtained from the "Harford County Test Records, Grades 7-12", a form also maintained by the cooperating schools as part of each student's permanent record file.

A decision was made early in the planning for this study to collect a wide range of information from the records of students in the High School Sample and to record it in a manner which would provide flexibility of utilization. This procedure provided some degree of choice in the selection and analysis of pertinent data and, since all data items were transferred to IBM cards, the information can be made available for future extensions of this study or for related research.

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[1] Arthur S. Otis, Otis Quick-Scoring Mental Ability Test, Gamma (New York: Harcourt, Brace and World, Inc.).

[2] College Entrance Examination Board, Scholastic Aptitude Test (New York: College Entrance Examination Board).

[3] American College Testing Program, American College Test Battery (Iowa City: The American College Testing Program, Inc.).

A five-page data collection form was designed for the transfer of raw data from high school records to coded entries which were later punched on IBM cards. Each form carried data for twenty students. An abridged duplicate of the form and the coding system used are presented in Appendix A. The first page of the data collection form had space for entries which identified each student by an assigned number, sex, year of graduation, quintile rank in graduating class, and grade of entry (nine or ten) into the study school. The Otis I.Q. and SAT and ACT college aptitude scores were also entered on this page.

The remaining four pages of the form were identical, and a separate page was used for entry of course of study and achievement data for each grade (nine through twelve) in senior high school. This procedure allowed the data to be analyzed for any grade level or combination of grade levels. The data included the number of credit units and grade points earned in each academic subject area and the number of enrollment units earned in non-academic subjects, including the arts.

The enrollment unit was utilized as a device which equated time spent in non-academic subjects with time spent in academic subjects, irrespective of the amount of credit toward graduation assigned to the non-academic subject. For example, a high school English course which met five regular class periods per week for thirty-six weeks carried one credit unit. A music or art class which took up the same amount of time in a student's schedule was assigned one enrollment unit, despite the fact that it might carry only three-fourths of a unit of credit toward graduation. Subjects which were offered for less than the full school year or for less than five class periods per week were assigned partial units on a proportionate basis.

Between sixty and seventy data items were entered on the data collection forms and subsequently punched on IBM cards for each of the 944 students in the High School Sample. Thus, over 60,000 data items were processed from the high school records of the study population.

The College Sample

The follow-up reports submitted to the Maryland State Department of Education for the 1963 and 1965 graduating classes of the three study schools were used to identify students in the High School Sample who might be included in the College Sample and the institutions of higher learning they entered. Information was obtained directly from student files at Harford Junior College for students who attended that institution. Letters were sent to the registrars of other colleges and universities requesting transcripts of the college work of students who were tentatively placed in the College Sample. Some institutions required written permission from students before transcripts could be released. In these cases, letters were sent to the students requesting the necessary permission. Only eight students were deleted from the possible sample group because of the inability of the researcher to obtain transcripts of their college work. In no instance did a student actually deny permission to obtain the transcript, but five students did not reply to repeated letters of request, and current mailing addresses could not be located for the remaining three students. Transcripts were obtained from each institution attended for students who had enrolled in more than one college. Student transcripts yielded the following data:

1. Number of semesters enrolled in college
2. Semester hours and grade points earned in five academic subject areas: English, social science, mathematics, and foreign language.
3. Semester hours enrolled in arts subjects
4. Major and minor fields of study for students with eight semesters of college

A two-page worksheet was designed for the transfer of raw data from the college transcripts of each student in the College Sample. One page of the worksheet was a tally form upon which was entered the number of semester hours and grade points earned in the five academic subject areas. Data for college courses in journalism were entered under the "English" category, and data for engineering courses were entered under the "science" category.

Semester hours earned in arts subjects were also tallied on this worksheet, as were hours for any additional subject areas in which students with eight semesters of college earned twenty or more semester hours of credit. This latter information was collected to identify major and minor fields of college study.

The second page of the worksheet was a summary sheet which carried totals for semester hours and grade points earned in the five academic subject categories, semester hours earned in arts subjects and coded entries for major and minor areas of college study. In addition, coded entries were made on the summary worksheet which identified certain characteristics of the institutions entered by students in the College Sample. This identification data included the following:

1. Location - Maryland or out-of-state
2. Type - Two-year public college, four-year state college, four-year private college, state university, private university, or accredited art institute or music conservatory.
3. Specific institution if one of the following: Harford Junior College, Towson State College, or the University of Maryland

Preliminary inspection of the college follow-up reports for the three graduating classes included in this study indicated that a sizable number of students entered the three Maryland institutions named in item 3, above. Provision was made to identify these students in the data collection procedure so that the exact proportion of the College Sample which entered the three institutions could be determined. If the proportion was as high as anticipated, special attention could be given to the entrance requirements of those institutions in the portion of the study devoted to the number and type of specific academic subject units required for admission to selected colleges and universities. The identification of students entering Harford Junior College, Towson State College, and the University of Maryland also provided the possibility of utilizing the data collected in this study in future research related to the academic achievement of graduates of Harford County high schools who attended the three Maryland institutions.

Entries on the individual college student worksheets were transferred to summary forms which carried coded entries for twenty students each. Data entries were transferred to IBM cards from these forms. A total of approximately 8,000 data items were punched on cards for the 364 students in the College Sample. This represented a summarization of a considerably larger number of data items which originally transferred from college transcripts to the individual college student data worksheets.

Copies of the forms, letters, and coding system used in the collection and processing of data related to the College Sample may be found in Appendix A.

College Admission Requirements

Six research questions were outlined in Chapter II as a basis for the organization of this study. Only one of these, Research Question Six, required data which were unavailable from the high school and college records of the study population. Research Question Six was stated as follows:

> Is there evidence to indicate that high school students could enroll in more arts subjects and still earn the number of specific subject units required by most colleges with selective admission policies?

The college admission requirements of a sample group of two hundred colleges were studied as a means of collecting data to answer this question.

The sample colleges were selected from a categorized listing in the "College Admission Selector" section of the 1968-69 edition of Barron's Profiles of American Colleges.[4] This section groups four-year accredited colleges and universities into six major categories, ranging from those with the most selective admission requirements to those requiring only a high school diploma. The categories are (1) most competitive, (2) highly competitive, (3) very competitive, (4) competitive, (5) less competitive, and (6) non-competitive. The sample of 200 institutions was selected from 755 institutions listed alphabetically under the first four of these categories.

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[4] Benjamin Fine (ed.), Barron's Profiles of American Colleges (1968-69 edition; Woodbury, New York: Barron's Educational Series, Inc., 1968), pp. 748-754.

The outline below indicates the procedure used in selecting the sample group of colleges for which admission data were compiled.

1. Most competitive category - all 23 colleges listed were selected.
2. Highly competitive category - 24 colleges were selected by choosing every third college listed.
3. Very competitive category - 55 colleges were selected by choosing every third college listed.
4. Competitive category - 98 colleges were selected by choosing every fifth college listed.

This procedure intentionally weighted the sample colleges in the direction of those which exercise a rather high degree of selection in their admission procedures. It was felt that the findings of this portion of the study would tend to be discounted if they appeared to be representative of colleges which were relatively non-selective in their choice of entering students. A categorized listing of the two hundred colleges included in the sample may be found in Appendix B.

The tenth edition (1968) of American Colleges and Universities[5] was used as the source of data pertaining to the admission requirements of the sample colleges. This reference, published quadrennially since 1928, is recognized as the most authoritative sourcebook of information on higher education now available. All institutional information in this volume was obtained directly from officials of the colleges and universities described. The admissions information includes not only the number of high school academic units required, but also the number of units which the institution recommends for its prospective students.

It was the viewpoint of this researcher that students seeking admission to a specific college tend to look upon "recommended" preparation as "necessary" preparation, particularly if the institution in question seeks a rather selective student body. Discussions with high school guidance counselors have corroborated this viewpoint. Therefore, totals for the number of academic units which were required and recommended were tallied for each of the two hundred institutions in the sample.

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[5] Otis A. Singletary (ed.) American Universities and Colleges (tenth edition; Washington: American Council on Education, 1968).

II. DATA TREATMENT

Most of the data treatment was either performed directly on the Burroughs B5500 computer or else was performed manually using data which had been partially processed by the computer. Punched cards containing coded data transferred from the high school and college records of the study population provided the computer input.

Six questions were posed in Chapter II as a basis for the organization of this study. The discussion which follows will describe the procedures used in the data treatments designed to provide answers to each of these research questions. All questions refer only to the population sample drawn for this study.

Research Question One

> To what extent did college preparatory students enroll in high school arts subjects during the period under study?

The basic procedure used in the treatment of enrollment data was to express enrollments as percentages of the study population and of the various sub-populations within it. Sub-populations included the following:

1. Male students
2. Female students
3. 1963 high school graduates
4. 1965 high school graduates
5. 1967 high school graduates

Thus, all high school enrollment data was analyzed by sex of student and by year of graduation.

Two approaches were used in the treatment of enrollment data. The first involved calculating the percentage of students who enrolled in arts subject at each grade level, nine through twelve. Enrollment percentages were calculated for arts subjects as a group and for each art subject: music, art, and dramatics.

The second approach was to establish categories representing various levels of enrollment in arts subjects and to calculate the percentage of students in each category. The enrollment categories are outlined below:

1. No arts enrollment units in grades nine through twelve.
2. No arts enrollment units in grades ten through twelve.
3. Some, but less than three, arts enrollment units in grades ten through twelve.
4. Three or more arts enrollment units in grades ten through twelve.

These categories differentiated between enrollment units earned in arts subjects in grade nine and those earned in grades ten through twelve. During the early part of the period covered by this study, art, music, physical education, and industrial arts or home economics formed a block of subjects for which five to ten periods per week were allotted in the basic ninth grade program for all students. Depending upon the circumstances, the student did not always have a free choice in the subjects he took within this block. Such factors as individual school policy, scheduling conflicts, and the availability of teaching personnel and classroom space affected student choices in this area of the curriculum. Therefore, at the ninth grade level the extent to which students enrolled in art subjects does not necessarily reflect the extent to which students freely elected these subjects. Ninth grade arts enrollment figures were important to the study, however, because they entered into the extent to which the study population had curricular experiences in the arts during the four years of senior high school.

Beginning at the tenth grade level, all arts subjects were elective, and except for a very few isolated instances, students were enrolled for five class periods per week for the entire school year. Therefore, for all practical purposes, enrollment category three--some, but less than three arts enrollment units in grades ten through twelve--includes students who earned either one or two arts enrollment units during the last three years of high school. The last enrollment category--three or more arts units in grades ten through twelve--was established as the category which defined high enrollment in arts subjects. These students represented almost twenty per cent of the sample group. Only thirty-six students earned four enrollment units in arts and none earned more so, for the most part, this category represents students who earned three enrollment units in arts subjects in grades ten through twelve.

Research Question Two

> Is there evidence of a trend of diminishing enrollment in arts subjects during the period under study?

The percentage of 1965 graduates who enrolled in arts subjects at each grade level was compared with that for the 1963 graduates. Losses or gains for the period represented by the two graduating classes were noted. Similar comparisons were made between the 1965 and 1967 graduating classes. Finally, the percentage of students enrolled in arts subjects from the 1967 graduating class was compared with that for the 1963 graduating class. These computations gave some indication of the direction (increasing or diminishing) of arts enrollment at each grade level during the period under study. The same procedures were repeated to determine if there were increases or decreases during the period in the percentage of students falling into each of the four arts enrollment categories defined under the description of data treatments performed to answer Research Question One.

Losses or gains in percentage of students enrolling in arts were not taken as evidence of a trend unless they were large enough to be statistically significant. This was determined by using the *t*, or critical ratio, test for the significance of the difference between two percentages.

This test is expressed by the formula[6]

$$t = \frac{D\%}{SE_{D\%}}$$

in which

$D_{\%}$ = difference between two percentages

$SE_{D\%}$ = standard error of difference between two percentages.

The standard error of difference between two percentages is expressed by the formula[7]

$$SE_{D\%} = \sqrt{PQ \quad \frac{1}{N_1} + \frac{1}{N_2}}$$

in which

P = mean of the percentages of the two groups

A = (1 - P)

N_1 = number of cases (students) in Group 1

N_2 = number of cases (students) in Group 2

The mean of the percentages of the two groups, P, is found in the formula

$$P = \frac{N_1 \, P_1 \div N_2 \, P_2}{N_1 \div N_2}$$

The t, or critical ration, values obtained for the differences in percentages tested by the above procedure were compared with tabled values at the .05 and .01 levels of confidence. The tabled values are arranged by various degrees of freedom (df). The degrees of freedom are determined by a formula which takes into account the size of groups from which the two percentages were obtained:

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[6] Henry E. Garrett, Elementary Statistics (New York: Longmans Green and Co., 1956), p. 96.

[7] Ibid., pp. 103-105.

$$df = (N_1 - 1) + (N_2 - 1)$$

The tabled value for t at the .05 level of confidence remains constant at 1.96 for all degrees of freedom over 100. Similarly, at the .01 level of confidence, the tabled value of t is 2.58 for all degrees of freedom over 100. The sizes of the groups for which enrollment percentages were compared in this study produced df values well over the 100 mark. Therefore, differences in enrollment percentages which produced t values of at least 2.58 were judged to be significant at the .05 level of confidence. Differences in percentages which produced t values below those necessary for the .05 level of confidence were not judged to be statistically significant.

Research Question Three

> Do students with high enrollment in high school arts subjects differ from other students in the variables listed below?
>
> a. Sex
> b. I. Q.
> c. Quintile rank in high school graduating class
> d. Grade point average in high school academic subjects
> e. Number of credits earned in high school academic subjects
> f. Total number of high school credits earned
> g. Per cent entering college
> h. Per cent withdrawing from college
> i. Selection of college fields of study
> j. Enrollment in college arts subjects

Students with high arts enrollment were previously defined as those having three or more enrollment units in arts subjects in grades ten through twelve. This group numbered 185 students, leaving 759 students from the High School Sample of 944 who were classified as "other students." Sex differences between the two groups were determined by calculating the percentage of male and female students in each. The mean Otis I. Q. score for each group was calculated, as was the mean quintile rank in graduating class. Mean grade point average in high school academic subjects, the mean number of high school units in academic subjects, and the mean number of total high school units of credit earned were also calculated and compared for both groups.

The last four variables listed under Research Question Three applied to the 1963 and 1965 high school graduates who formed the College Sample. The percentage of students with high enrollment in high school arts subjects who entered college was compared with that for other students. Comparisons were also made between the percentages of both groups who entered, but later withdrew from college. In each instance the difference in percentage between the two groups was subjected to the _t_ test of significance described earlier.

The comparison of major and minor fields of college study selected by high arts students and other students was limited to the 73 students in the College Sample who completed eight semesters of college. The number and percentage of each group selecting various fields was calculated as the basis for comparison. Finally, the distribution of high arts students and other students by number of semester hours earned in college arts subjects was compared. Comparisons were made on the basis of both four and eight semesters of college work. For the purposes of this analysis, college arts subjects included all courses in music, the visual arts, theater and drama, fine arts or integrated arts, costume and interior design, and architecure. While the combination speech and dramatics, was categorized as an arts subject at the high school level, college courses in public speaking and speech therapy were not classified as arts subjects.

Research Question Four

> When I. Q. and sex variables are controlled, is there a significant relationship between level of enrollment in high school arts subjects and grade point average in high school academic subjects?

The relationship between level of enrollment in high school arts subjects and grade point average in high school academic subjects was investigated by testing the following null hypothesis:

> When I. Q. and sex of student are controlled, there is no significant relationship between level of enrollment in high school arts subjects and grade point average in high school academic subjects.

The I. Q. was derived from the "Otis Quick Scoring Test of Mental Ability" which all students in the High School Sample took in tenth grade. As was indicated in the earlier portion of this chapter dealing with data collection procedures, tests scores were collected for students who took the College Entrance Examination Board "Scholastic Aptitude Test: (SAT) and the American College Testing Program "ACT Battery" (ACT). When this study was originally designed, consideration was given toward using these test scores as additional measures of scholastic aptitude. However, these two tests were an optional, rather than a required, part of the testing program of the schools involved in this study. Consequently, the proportion of students in the High School Sample who took these tests was not large enough to warrant separate analyses of data using the SAT and ACT scores as additional measures of scholastic aptitude.

Preliminary analysis of data indicated that a larger proportion of girls than boys enrolled in high school arts subjects and that girls had a slightly higher grade point average in high school academic subjects. Consequently, both sex of student and I.Q. were controlled in testing the null hypothesis.

The null hypothesis was tested by the multiple linear regression techniques described by Bottenberg and

and Ward in the technical report, Multiple Linear Regression, produced in 1963 for the U. S. Air Force Systems Command.[8] The procedure was programmed for the Burroughs B5500 computer by Dr. Milton D. Jacobson of the Bureau of Educational Research at the University of Virginia. The Computer calculated and printed out the following statistics for each variable: means, standard deviations, zero-order correlations of each variable with each other variable, the standard weights, partial regression coefficients, error terms, constants to be used in the regression equations, and the squared multiple correlation coefficients (RSQ's).

When used to test a hypothesis, analysis by the linear regression technique requires the formation of a predictor equation which expresses the relationship between the predictor variables and the dependent variable or criterion. This predictor equation is referred to as the Full Model. The criterion in the instance under discussion was grade point average in high school academic subjects and the Full Model contained the following predictor variables:

1. I. Q.
2. Sex
3. High enrollment in high school arts subjects
4. Less than high enrollment in high school arts subjects.

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[8] Robert A. Bottenberg and Joe H. Ward, Jr., Applied Multiple Linear Regression. Technical Documentary Report PRL-TDR-63-6, United States Air Force Systems Command, Clearinghouse for Federal Scientific and Technical Information Document AD 413-128, 1963.

In multiple linear regression analysis, each hypothesis regarding the effect of a particular predictor variable or combination of variables upon the criterion is tested by placing restrictions on the variable(s) in the Full Model. A predictor equation referred to as the Restricted Model is formed which takes the restriction(s) into account. The squared multiple correlation obtained from the Full Model (RSQ_{full}) and the squared multiple correlation obtained from the Restricted Model (RSQ_{rstr}) are used in the formula

$$F = \frac{(RSQ_{full} - RSQ_{rstr}) \Big/ (df_1)}{(1 - RSQ_{full}) \Big/ (df_2)}$$

to calculate the F statistic, where the degrees of freedom, df_1 and df_2, depend upon the size of the sample and the number of variables in the Full and Restricted Models. The F statistic is Snedecor's F-ratio used with analysis of variance techniques as a basis for the acceptance or rejection of a null hypothesis. In the computer program utilized in this study, the values for RSQ_{full}, RSQ_{rstr}, df_1, df_2, and the F-ratio derived from the formula stated above were printed out. The computer also printed a probability statistic based upon the calculated F-ratio value.

In this study the relationships between independent variables and the criterion were judged to be significant if they occurred at the .05 level of confidence. Therefore, if the probability statistic was .05 or less, the null hypothesis was rejected because there was the probability of a chance relationship in only five or less cases in one hundred. Conversely, the null hypothesis was accepted if the probability statistic indicated the relationship could be attributed to chance in more than five cases out of one hundred.

In testing the null hypothesis developed for research Question Four, a Restricted Model was generated which took into account the effect of the two predictor variables related to level of enrollment in high school arts subjects, and the variables of I.Q. and sex of student were controlled by appropriate covariance procedures. A probability statistic greater than .05 would indicate that the null hypothesis could be accepted. Therefore, under these conditions, there was no relationship between level of enrollment in high school arts subjects and grade point average in high school academic subjects. Conversely, a probability statistic of .05 or less would indicate that a significant relationship existed.

An additional step in the analysis procedure was needed to identify which of the two categories, (1) high level of enrollment, or (2) other than high level of enrollment, had the significant effect upon the criterion, grade point average in high school academic subjects. Categorical variables are treated as dichotomous pairs in multiple linear regression analysis and reference must be made to the standard weights assigned to each member of the pair to make a determination as to which variable is more responsible for the combined effect upon the criterion. The variable with the higher standard weight is more likely to be responsible for the significant effect upon the criterion.

Research Question Five

> When I.Q. and sex variables are controlled, is there a significant relationship between level of enrollment in high school arts subjects and grade point average in college academic subjects?

The College Sample was divided into two categories: (1) students with continuous enrollment in college, and (2) students who withdrew from college.

The continuous enrollment group contained students with eight semesters in college (1963 high school graduates) and students with four semesters in college (1965 high school graduates). The basic null hypothesis formulated for the continuous enrollment group was stated as follows:

> When I.Q., sex, and number of semesters in college are controlled, there is no significant relationship between level of enrollment in high school arts subjects and grade point average in college academic subjects.

The basic Full Regression Model generated to test this hypothesis contained the following variables:

1. I.Q.
2. Sex
3. Four college semesters (1965 high school graduates)
4. Eight college semesters (1963 high school graduates)
5. High enrollment in high school arts subjects
6. Other than high enrollment in high school arts subjects

Six variations of this basic Full Model were generated; one for each of the following criterion variables:

1. College English GPA
2. College social science GPA
3. College science GPA
4. College mathematics GPA
5. College foreign language GPA
6. Composite GPA for college academic subjects

Restricted Models were generated to test the effect of each of the six predictor variables upon each criterion variable. Since number of college semesters (variables 3 and 4) and level of enrollment in high school arts subjects (variables 5 and 6) were treated as paired categorical variables, this produced four Restricted Models for each of the six Full Models. Thus, a total of twenty-four Restricted Models was generated to determine various aspects of the relationship between level of enrollment in high school arts subjects and GPA in college academic subjects for students with continuous enrollment in college.

It should be understood that, while the multiple linear regression analyses procedures outlined in this section were established to test the basic null hypothesis that, under the conditions outlined, there is no significant relationship between level of enrollment in high school arts and GPA in college academic subjects; each of the twenty-four Restricted Models was generated to test a null hypothesis regarding the effect of either a single predictor variable or a pair of categorical predictor variables upon one of the six criterion variables. One such null hypothesis could be stated as follows:

> When other variables in the Full Model are controlled, there is no significant relationship between sex of student and college GPA in English.

Another example would be:

> When other variables in the Full Model are controlled there is no relationship between level of high school arts enrollment and the composite GPA in college academic subjects.

So long as this general procedure is kept in mind, it would seem unnecessary to reproduce in this report each null hypothesis stated for the twenty-four regression models generated to investigate various aspects of the relationship between level of enrollment in high school arts subjects and GPA in college academic subjects for students with continuous enrollment in college.

With one exception, the procedures outlined in the preceding paragraphs were duplicated for the portion of the College Sample which withdrew from college. The number of semesters in college was not used as a predictor variable in the regression models generated for this group. Represented in the group were students who attended college from one to seven semesters before withdrawing. Therefore, it was impractical to place the 127 students in this group into college enrollment categories. The mean number of semesters in college for the withdrawal group as a whole was 2.87. A total of six Full Models and eighteen Restricted Models was generated for the withdrawal group as a means of investigating the relationship between level of high school arts enrollment and college GPA in academic subjects.

Research Question Six

> When I.Q. and sex variables were controlled, is there a significant relationship between level of enrollment in high school academic subjects and grade point average in college academic subjects?

This question was important to the study, since the number of non-academic subjects, such as the arts which a student can take in high school is directly related to the number of academic subjects he elects over and above those which are required for his program of studies. If a student feels he must take as many academic subjects as possible in order to succeed in college, he will have little room left in his schedule for non-academic electives. If, on the other hand, it could be shown that when other variables are controlled, there is no significant relationship between level of enrollment in high school academic subjects and subsequent grade point average in college in these subjects, he could possibly be encouraged to broaden his participation in the non-academic areas of the curriculum.

As was stated in Chapter I, the accepted minimal four-year program for the students in the High School Sample was four units each in English and social studies and three units each in science, mathematics and foreign language. Therefore, the following were established as "high enrollment" categories in each of the academic subject areas:

1. English - more than four units
2. Social studies - more than four units
3. Science - more than three units
4. Mathematics - more than three units
5. Foreign language - more than three units

The data treatments outlined under Research Question Five were repeated as a means of investigating the relationship between level of enrollment in each of the five academic subject areas in high school and college GPA in each area, as well as the composite college GPA for the five subject areas. Therefore, six Full Regression Models and twenty-four Restricted Models were generated in each subject area for the continuous enrollment portion of the College Sample. Likewise, six Full Models and eighteen Restricted Models were generated in each subject area for the withdrawal group. This produced a total of 60 Full Models and 210 Restricted Models for this phase of the study.

Research Question Seven

> Is there evidence to indicate that high school students could enroll in more arts subjects and still earn the number of specific subject units required by most colleges with selective admission policies?

The following items were available for each of the two hundred colleges for which admission requirements data were collected:

1. Total number of academic subject units required or recommended.

2. Number of specified academic subject units required or recommended.

3. Number of units required or recommended in each academic subject area.

Distribution categories ranging from none to more than seventeen units were established for the first two items. Distribution categories for the third item--number of units required or recommended in each academic subject--ranged from none to four units. The number and per cent of sample colleges falling into each distribution category was calculated for each item. Calculations were made for the total sample of two hundred colleges and for the four subgroups within the sample representing the degree of selectivity exercised by the colleges in admitting new students. The findings were then compared with the number and distribution of high school units in academic subjects earned by the college preparatory students included in this study.

CHAPTER VI

FINDINGS

This chapter will present the findings produced by the various data treatments discussed in Chapter V. Where applicable, reference will be made to the seven research questions used as a basis for structuring the study.

I. ENROLLMENT PATTERNS IN HIGH SCHOOL ARTS SUBJECTS

Tables 9 through 25 show the combined results of the data treatments performed in answering Research Questions One and Two. These questions were stated as follows:

1. To what extend did college preparatory students enroll in high school arts subjects during the period under study?
2. Is there evidence of a trend of diminishing enrollment in arts subjects during the period under study?

Tables 10 through 21 show the per cent of students in the High School Sample by graduating class (1963, 1965 and 1967) enrolled in arts subjects at each grade level, nine through twelve. Per cent of students enrolled is shown for male students, female students and all students. Enrollment percentages are shown for each arts subject (art, music, and drama) and for arts subjects as a group. This latter category is expressed in the Tables as "Total Arts."

Total arts enrollment percentages were calculated by excluding duplicates, i.e., students who enrolled in more than one arts subject at a given grade level. As is indicated in Table 9, this was not a large number of students. Forty-four students, or 4.7 per cent of the total sample, enrolled in two arts classes in ninth grade, and seventeen of these students completed ninth grade before entering one of the study schools. There was almost no duplication of arts subject enrollment in grades ten or eleven. Only nine students from the total sample of 944 had simultaneous enrollment in two arts classes at either of these grade levels. Duplicate enrollments increased somewhat at the twelfth grade level with thirty-four students enrolled in two arts subjects. This was still a relatively small group, representing only 3.6 per cent of the total sample.

Table 10 indicates the percentage of male students enrolled in arts subjects in grade nine. Arts subjects at grade nine included only music and art, since drama was not offered at this level in the study schools. The percentages are based upon the number of male students in each graduating class represented in the sample. These numbers are given in the second column of the table.

Inspection of Table 10 reveals that 70.7 per cent of the 1963 male graduates enrolled in arts subjects, with slightly more than twice as many enrolled in music as in art. By 1965, the proportion of male students who enrolled

TABLE 9

DISTRIBUTION OF STUDENTS IN SAMPLE WITH SIMULTANEOUS ENROLLMENT IN TWO ARTS SUBJECTS BY GRADE LEVEL AND GRADUATING CLASS

Graduating Class	N	9*	10	11	12
1963	217	17	1	1	11
1965	354	16	1	3	12
1967	373	11	1	2	11
TOTAL	944	44	3	6	34
PER CENT OF SAMPLE		4.7	0.3	0.6	3.6

*Includes following distribution of students who entered study schools in tenth grade:

1963 - 3
1965 - 4
1967 - 10

TOTAL - 17 (1.8 per cent of sample)

TABLE 10

PER CENT OF MALE STUDENTS IN SAMPLE BY GRADUATING CLASS ENROLLED IN ARTS SUBJECTS IN GRADE NINE

Graduating Class	N	MUSIC	ART	TOTAL ARTS++
1963	116	54.3	25.0	70.7
1965	161	39.1	13.0	45.3
Difference 1963-1965		-15.2*	-12.0*	-25.4**
1967	204	30.9	10.3	41.2
Difference 1965-1967		- 8.2	- 2.7	- 4.1
Difference 1963-1967		-23.4**	-14.7**	-29.5**
TOTAL SAMPLE (MALE)	481	39.3	14.8	48.4

++ Excluding duplicates
* Significant at .05 level
** Significant at .01 level

Note: Drama was not offered in grade nine.

in music in grade nine declined by 15.2 per cent, and a similar decline of 12.0 per cent took place in art enrollment. Both of these losses were found to be significant at the .05 level of confidence when the differences in percentages were subjected to the critical ratio, or t, test of significance described in Chapter V.

The proportion of male 1965 graduates who enrolled in arts subjects was 45.3 per cent, a decline of 25.4 per cent from that of the 1963 graduates. This difference was significant at the .01 level. The trend toward declining male enrollments in ninth grade arts classes continued with the 1967 graduating class, though at a reduced rate. The proportion of male students enrolled in ninth grade arts subjects declined during the period covered by the study by 23.4 per cent for music, 14.7 per cent for art, and 29.5 per cent for both subjects combined, when duplicate enrollments were excluded. Each of these losses was significant at the .01 level. Of the total sample of 481 male students, 48.8 per cent enrolled in one or more ninth grade arts subjects, with 39.3 per cent enrolled in music and 14.8 per cent enrolled in art.

As can be seen by data presented in Table 11, the proportion of female students in the sample who enrolled in ninth grade arts subjects was higher than that for male students. Slightly over 65 per cent of the girls enrolled in ninth grade arts. Here again, more than twice as many

TABLE 11

PER CENT OF FEMALE STUDENTS IN SAMPLE BY GRADUATING CLASS ENROLLED IN ARTS SUBJECTS IN GRADE NINE

Graduating Class	N	MUSIC	ART	TOTAL ARTS++
1963	101	52.5	30.7	76.2
1965	193	51.8	23.8	73.1
Difference 1963-1965		- 0.7	- 6.9	- 3.1
1967	169	38.5	14.8	50.3
Difference 1965-1967		-13.3*	- 9.0*	-22.8**
Difference 1963-1967		-14.0*	-15.9**	-25.9**
TOTAL SAMPLE (FEMALE)	463	47.1	22.0	65.4

++ Excluding duplicates
* Significant at .05 level
** Significant at .01 level

Note: Drama was not offered in grade nine.

students enrolled in music (47.1 per cent) as enrolled in art (22 per cent). There was also a trend of diminishing enrollment in ninth grade arts subjects among girls during the period represented by the three graduating classes, but the major decline took place within the class of 1967, rather than within the 1965 graduating class as was the case with male students. Over half (52.5 per cent of the 1963 female graduates enrolled in ninth grade music offerings and 30.7 per cent enrolled in art. When duplicate enrollments were excluded, 76.2 per cent of the female 1963 graduates in the sample enrolled in an arts subject. There were slight losses in female enrollments in ninth grade art and in total arts within the 1965 graduating class, but these were not statistically significant. However, the proportion of female students enrolled in ninth grade music from the 1967 graduating class declined by 13.3 per cent over that of the 1965 female graduates. Losses of 9.0 per cent for art and 22.8 per cent for total arts were registered. The decline of 14.0 per cent in female enrollment in ninth grade music for the period represented by the three graduating classes was significant at the .05 level of confidence. Enrollment losses of 15.9 per cent for art and 25.9 per cent for total arts were significant at the .01 level.

Combined ninth grade arts enrollment data for male and female students is presented in Table 12. Of the 1963

TABLE 12

PER CENT OF ALL STUDENTS IN SAMPLE BY GRADUATING CLASS ENROLLED IN ARTS SUBJECTS IN GRADE NINE

Graduating Class	N	MUSIC	ART	TOTAL ARTS++
1963	217	53.5	27.7	73.3
1965	354	46.1	18.9	60.5
Difference 1963-1965		- 7.4	- 8.8*	-12.8**
1967	373	34.3	12.3	43.7
Difference 1965-1967		-11.8**	- 6.6	-16.8**
Difference 1963-1967		-19.2**	-15.4**	-29.6**
TOTAL SAMPLE	944	43.1	18.3	56.8

++ Excluding duplicates
* Significant at .05 level
** Significant at .01 level

Note: Drama was not offered in grade nine.

graduates, 53.5 per cent enrolled in music and 27.7 per cent enrolled in art. Almost three fourths of the class (73.7 per cent) enrolled in at least one ninth grade arts subject. This proportion declined by 12.8 per cent for the 1965 graduates and another 16.8 per cent for the 1967 graduates, with the result that more than half (56.8 per cent) of the sample students from the class of 1967 enrolled in an arts subject in grade nine. Each of the percentage losses in total arts enrollment for the period was significant at the .01 level. Both art and music had steady losses in enrollment during the period. When the proportion of 1963 graduates enrolled in ninth grade music is compared with that of the 1967 graduates, a loss of 19.2 per cent is noted. Similar losses of 15.4 per cent were registered for art and 29.6 per cent for total arts. Each of these percentage losses was significant at the .01 level of confidence. Of the total High School Sample, 56.8 per cent enrolled in at least one arts subject in grade nine, with 43.1 per cent enrolled in music and 18.3 enrolled in art.

A number of the differences in enrollment percentages which are not marked as being statistically significant in the preceeding tables and in those which follow would appear to be at least significant at the .05 level of confidence. In other instances, differences between two percentages which are relatively small were found to be significant. Therefore, before proceeding with a discussion of the findings regarding arts enrollments in grades ten through twelve, several observations might be made regarding the procedure for determining the significance of the difference between two percentages. In this procedure, discussed earlier in Chapter V, the standard error of the difference between the two percentages is calculated and then divided into the actual difference to produce a critical ratio or t value. For the size groups for which arts enrollment percentages were calculated in this study, a t value of 1.96 or better indicates that the percentage difference is significant at the .05 level of confidence. A t value of 2.58 or better is necessary for the difference to be significant at the .01 level of confidence.

Differences between percentages which are at either the lower or upper ends of the distribution scale will produce higher t values than the same differences between two percentages which are closer to the middle of the scale. This is illustrated by the example below which shows t values produced by a 10 per cent difference in percentages of the same population groups when these percentages are 10 and 20 per cent, 40 and 50 per cent, and 80 and 90 per cent.

N_1	N_2	P_1	P_2	$D\%$	$SE_{D\%}$	t
100	150	10.0	20.0	10.0	4.7	2.12
100	150	40.0	50.0	10.0	6.4	1.56
100	150	80.0	90.0	10.0	4.5	2.22

The size of the population groups also affects the significance of the differences between two percentages. This is illustrated by the example below in which the percentages are held constant, but the size of the population groups are changed.

N_1	N_2	P_1	P_2	$D_{\%}$	$SE_{D\%}$	t
100	150	10.0	20.0	10.0	4.7	2.13
200	300	10.0	20.0	10.0	3.3	3.03

Tables 13, 14, and 15 present data showing the proportion of students in the High School Sample enrolled in arts subjects in grade ten. As can be seen by referring to Table 13, the percentage of the total sample of male students enrolled in arts subjects at the tenth grade level (29.7) was considerably lower than that for ninth grade (48.4). However, there was very little difference in the proportion of male students in each of the three graduating classes who enrolled in at least one arts subject. This was 31.0 per cent for the 1963 graduates and diminished by approximately one per cent for each of the two succeeding classes in the sample. Of the 1963 graduates, 18.1 per cent enrolled in tenth grade music and this increased by only one percentage point during the period. Enrollment in art, however, steadily declined from 8.6 per cent of the 1963 male graduates to 2.9 per cent of the 1967 male graduates. The total loss of 5.7 per cent during the period was significant at the .05 level. Drama enrollments increased slightly from

TABLE 13

PER CENT OF MALE STUDENTS IN SAMPLE BY GRADUATING CLASS ENROLLED IN ARTS SUBJECTS IN GRADE TEN

Graduating Class	N	MUSIC	ART	DRAMA	TOTAL ARTS++
1963	116	18.1	8.6	4.3	31.0
1965	161	18.6	5.0	6.2	29.8
Difference 1963-1965		+ 0.5	- 3.6	+ 1.9	- 1.2
1967	204	19.1	2.9	6.9	28.9
Difference 1965-1967		+ 0.5	- 2.1	+ 0.7	- 0.9
Difference 1963-1967		+ 1.0	- 5.7*	+ 2.6	- 2.1
TOTAL SAMPLE (MALE)	481	18.7	5.0	6.0	29.7

++ Excludes Duplicates
* Significant at .05 level

4.3 per cent of the 1963 male graduates to 6.9 per cent of the 1967 male graduates. Of the total sample of 481 male students, 18.7 per cent enrolled in music, 5.0 per cent in art and 6.0 per cent in drama at the tenth grade level.

As indicated in Table 14, the proportion of girls in the total sample who enrolled in an arts subject in grade ten was 49.7 per cent. This was exactly 20 per cent above the arts enrollment percentage for tenth grade boys. One fourth of the girls in the sample enrolled in music, 11.2 per cent enrolled in art and 13.8 per cent enrolled in drama. In contrast to the stability of male enrollment at the tenth grade level, the proportion of female students enrolled in arts subjects increased from 42.6 per cent of the 1963 graduates to 56.8 per cent of the 1967 graduates. This gain for the period of 14.2 per cent was significant at the .05 level. With the exception of a slight loss in drama enroll- in the 1965 graduating class, the proportion of female students enrolled in the individual art subjects increased with each succeeding class in the sample. Music enrollment increased from 22.8 per cent of the 1963 class to 27.2 per cent of the 1967 class. Art enrollment increased from 7.9 per cent to 13.0 per cent and drama enrollment increased from 12.9 per cent to 17.2 per cent.

Table 15 shows combined enrollment data for tenth grade boys and girls. The proportion of students enrolled in music at this level was over twice that for art or drama.

TABLE 14

PER CENT OF FEMALE STUDENTS IN SAMPLE BY GRADUATING CLASS ENROLLED IN ARTS SUBJECTS IN GRADE TEN

Graduating Class	N	MUSIC	ART	DRAMA	TOTAL ARTS++
1963	101	22.8	7.9	12.9	42.6
1965	193	24.9	11.4	11.4	47.2
Difference 1963-1965		+ 2.1	+ 3.5	- 1.5	+ 4.6
1967	169	27.2	13.0	17.2	56.8
Difference 1965-1967		+ 2.3	+ 1.6	+ 5.8	+ 9.6
Difference 1963-1967		+ 4.4	+ 5.1	+ 4.3	+14.2*
TOTAL SAMPLE (FEMALE)	463	25.3	11.2	13.8	49.7

++ Excludes duplicates
* Significant at .05 level

TABLE 15

PER CENT OF ALL STUDENTS IN SAMPLE BY GRADUATING CLASS ENROLLED IN ARTS SUBJECTS IN GRADE TEN

Graduating Class	N	MUSIC	ART	DRAMA	TOTAL ARTS++
1963	217	20.3	8.3	8.3	36.4
1965	254	22.0	8.5	9.0	39.3
Difference 1963-1965		+ 1.7	+ 0.2	+ 0.7	+ 2.9
1967	373	22.8	7.5	11.5	41.6
Difference 1965-1967		+ 0.8	- 1.0	+ 1.5	+ 2.3
Difference 1963-1967		+ 2.5	- 0.8	+ 3.2	+ 5.2
TOTAL SAMPLE	944	21.9	8.1	9.9	39.5

++ Excludes duplicates

This was true for each of the three graduating classes and for the sample as a whole. There was a slight gain during the period in music enrollment from 20.3 per cent of the 1963 graduates to 22.8 of the 1967 graduates. Percentage enrollments for art and drama were identical at 8.3 per cent for the 1963 class. These decreased by less than one per cent for art and increased by 3.2 per cent for drama during the period. There was a slight, but steady increase in total arts enrollment during the period from 36.4 per cent of the 1963 graduates to 41.6 per cent of the 1967 graduates in the sample. Almost 40 per cent of the total High School Sample enrolled in an arts subject at the tenth grade level with over half of this proportion (21.9 per cent) enrolled in music. Tenth grade art enrollments represented 8.1 per cent of the sample and drama enrollments 9.9 per cent.

Eleventh grade arts enrollment data are presented in Tables 16, 17, and 18. As indicated in Table 16, 37.9 per cent of the 1963 male graduates in the sample enrolled in an arts subject in grade eleven. This was 7.9 per cent higher than the tenth grade enrollment for this group. However, during the period under study, there was a decline of almost 15 per cent in the proportion of male students enrolled in eleventh grade arts subjects. This loss was significant at the .01 level. The proportion of boys enrolled in eleventh grade music was 17.2 per cent for the

TABLE 16

PER CENT OF MALE STUDENTS IN SAMPLE BY GRADUATING CLASS ENROLLED IN ARTS SUBJECTS IN GRADE ELEVEN

Graduating Class	N	MUSIC	ART	DRAMA	TOTAL ARTS++
1963	116	17.2	6.9	13.8	37.9
1965	161	18.0	3.7	6.8	28.0
Difference 1963-1965		+ 0.8	- 3.2	- 7.0	- 9.9
1967	204	14.2	3.4	3.9	23.0
Difference 1965-1967		- 3.8	- 0.3	- 2.9	- 5.0
Difference 1963-1967		- 3.0	- 3.5	- 9.9**	-14.9**
TOTAL SAMPLE (MALE)	481	16.2	4.4	7.3	27.7

++ Excludes duplicates
** Significant at .01 level

1963 graduates. This increased slightly with the 1965 class and declined to 14.2 per cent for the 1967 graduates. Eleventh grade male enrollment in art also diminished from 6.9 per cent of the 1963 graduates to 3.4 per cent of the 1967 graduates. The greatest enrollment loss was registered in eleventh grade drama which fell from 13.8 per cent of the 1963 male graduates to 3.9 per cent of the 1967 male graduates. This decline of almost 10 per cent was significant at the .01 level of confidence. Of the total male sample of 481 students, 27.7 per cent enrolled in eleventh grade arts subjects, excluding duplicates, with 16.2 per cent enrolled in music, 4.4 per cent enrolled in art and 7.3 per cent enrolled in drama.

There was little change in eleventh grade female enrollment in arts subjects during the period As indicated in Table 17, 44.6 per cent of the sample from the 1963 graduating class enrolled in arts, and there was a net gain of less than one-half of 1 per cent during the period. Music enrollment for this group also fluctuated but slightly with a net gain of 1.9 per cent during the period over the 21.8 per cent enrolled from the 1963 graduating class. The proportion of female students enrolled in eleventh grade art increased from 8.0 per cent of the 1963 group to 14.2 per cent of the 1967 group. This gain was offset by a loss of 7.5 per cent in drama enrollment during the period. This came very close to being statistically significant at the

TABLE 17

PER CENT OF FEMALE STUDENTS IN SAMPLE BY GRADUATING CLASS ENROLLED IN ARTS SUBJECTS IN GRADE ELEVEN

Graduating Class	N	MUSIC	ART	DRAMA	TOTAL ARTS++
1963	101	21.8	8.0	15.8	44.6
1965	193	20.7	9.3	13.0	42.0
Difference 1963-1965		- 1.1	+ 1.3	- 2.8	- 2.6
1967	169	23.7	14.2	8.3	45.0
Difference 1965-1967		+ 3.0	+ 4.9	- 4.7	+ 3.0
Difference 1963-1967		+ 1.9	+ 6.2	- 7.5	+ 0.4
TOTAL SAMPLE (FEMALE)	463	22.0	10.8	11.9	43.6

++ Excludes duplicates

.05 level with a t value of 1.92. The total sample of 463 girls included 43.6 per cent who enrolled in one or more eleventh grade arts subjects, with 22 per cent enrolled in music, 10.8 per cent enrolled in art, 11.9 per cent enrolled in drama.

Table 18 gives eleventh grade art enrollment data for the total High School Sample. Of the 1963 graduates, 19.4 per cent enrolled in music, and there was a change in this proportion of less than one per cent during the period covered by the study. Exactly twice as many of the 1963 graduates (14.8 per cent) enrolled in drama as enrolled in art (7.4 per cent). However, art enrollment changed only very slightly during the period, while drama enrollment at the eleventh grade level fell by 8.9 per cent. This difference was significant at the .01 level, as was the loss in total arts enrollment which fell from 41.0 per cent of the 1963 graduates to 32.2 per cent of the 1967 graduates. At the eleventh grade level, 35.8 per cent of the total sample enrolled in at least one arts subject, with 19.1 per cent enrolled in music, 7.5 per cent in art, and 9.5 per cent in drama.

Arts enrollment percentages at the twelfth grade level are presented in Tables 19, 20, and 21. Table 19 gives the data for male students, of which 19.0 per cent of the 1963 graduates enrolled in music and 5.2 per cent in art. Slight increases of 3.6 per cent in music and 2.2 per cent in art

TABLE 18

PER CENT OF ALL STUDENTS IN SAMPLE BY GRADUATING CLASS ENROLLED IN ARTS SUBJECTS IN GRADE ELEVEN

Graduating Class	N	MUSIC	ART	DRAMA	TOTAL ARTS++
1963	217	19.4	7.4	14.8	41.0
1965	354	19.5	6.8	10.2	35.6
Difference 1963-1965		+ 0.1	- 0.6	- 4.6	- 5.4
1967	373	18.5	8.3	5.9	32.2
Difference 1965-1967		- 1.0	+ 1.5	- 4.3*	- 3.4
Difference 1963-1967		- 0.9	+ 0.9	- 8.9**	- 8.8**
TOTAL SAMPLE	944	19.1	7.5	9.5	35.8

++ Excludes duplicates
* Significant at .05 level
** Significant at .01 level

TABLE 19

PER CENT OF MALE STUDENTS IN SAMPLE BY GRADUATING CLASS ENROLLED IN ARTS SUBJECTS IN GRADE TWELVE

Graduating Class	N	MUSIC	ART	DRAMA	TOTAL ARTS++
1963	116	19.0	5.2	20.7	38.8
1965	161	18.6	7.5	9.3	31.7
Difference 1963-1967		- 0.4	+ 2.3	-11.4**	- 7.1
1967	204	22.6	7.4	4.4	31.4
Difference 1965-1967		+ 4.0	- 0.1	- 4.9	- 0.3
Difference 1963-1967		+ 3.6	+ 2.2	-16.3**	- 7.4
TOTAL SAMPLE (MALE)	481	20.4	6.9	10.0	33.3

++ Excludes duplicates
** Significant at .01 level

were registered during the period. Again, drama enrollments declined severly from 20.7 per cent of the 1963 graduates to 4.4 per cent of the 1967 graduates. This loss of 16.3 per cent was significant at the .01 level. While total arts enrollment also declined steadily during the period, the 7.4 per cent loss of male enrollment in arts subjects was not significant at the .05 level. This loss represented a decline from 38.8 per cent of the 1963 male graduates to 31.4 per cent of the 1967 male graduates. Exactly one-third of the male students in the High School Sample enrolled in at least one twelfth grade arts subject, with 20.4 per cent enrolled in music, 6.9 per cent in art, and 10.0 per cent in drama.

The proportion of female students enrolled in arts subjects in grades twelve is given in Table 20. There was only a slight change of 1.7 per cent in music enrollment during the period from the 20.8 per cent enrolled from the 1963 graduating class. However, art enrollment jumped from 3.0 per cent of the 1963 female graduates to 14.0 per cent of the 1965 graduates. This gain was significant at the .01 level of confidence, as was the total gain of 11.8 per cent for the period. A loss of 8.7 per cent in female twelfth grade drama enrollment (significant at the .05 level) partially offset the gains in art enrollment during the period. Of the 1963 female graduates in the sample, 35.6 per cent enrolled in at least one arts subject in grade twelve. This

TABLE 20

PER CENT OF FEMALE STUDENTS IN SAMPLE BY GRADUATING CLASS ENROLLED IN ARTS SUBJECTS IN GRADE TWELVE

Graduating Class	N	MUSIC	ART	DRAMA	TOTAL ARTS++
1963	101	20.8	3.0	15.8	35.6
1965	193	21.8	14.0	12.4	45.1
Difference 1963-1965		+ 1.0	+11.0**	- 3.4	+ 9.5
1967	169	22.5	14.8	7.1	41.4
Difference 1965-1967		+ 0.7	+ 0.8	- 5.3	- 3.7
Difference 1963-1967		+ 1.7	+11.8**	- 8.7*	+ 5.8
TOTAL SAMPLE (FEMALE)	463	22.8	12.4	11.7	41.7

++ Excludes duplicates
* Significant at .05 level
** Significant at .01 level

increased to 45.1 per cent for the 1965 graduates and decreased to 41.4 per cent for the 1965 graduates. The net gain for the period was 5.8 per cent. The proportion of female students in the total sample who enrolled in one or more twelfth grade arts subjects was 41.7 per cent, with 22.8 per cent enrolled in music, 12.4 per cent enrolled in art, and 11.7 per cent enrolled in drama.

As indicated in Table 21, when twelfth grade enrollment percentages for boys and girls were combined, there was little change in either music or total arts enrollment during the period. Music enrollment increased from 19.8 per cent to 22.5 per cent and total arts enrollment diminished from 37.3 per cent to 35.9 per cent. However, the gain in art enrollment from 4.2 per cent in 1963 to 10.7 per cent in 1967 was significant at the .05 level. This was more than offset by a 12.8 per cent loss in drama enrollment which fell from 18.4 per cent in 1963 to 5.6 per cent in 1967. This difference was significant at the .01 level. Of the total sample of 944 students, 21.1 per cent enrolled in music, 9.3 per cent enrolled in art, 10.6 per cent enrolled in drama, and 37.4 per cent enrolled in at least one arts subject at the twelfth grade level.

The preceeding discussion described the degree to which students in the High School Sample enrolled in arts subjects at each grade level in the senior high school and the changes in grade level arts enrollment during the

TABLE 21

PER CENT OF ALL STUDENTS IN SAMPLE BY GRADUATING CLASS ENROLLED IN ARTS SUBJECTS IN GRADE TWELVE

Graduating Class	N	MUSIC	ART	DRAMA	TOTAL ARTS++
1963	217	19.8	4.2	18.4	37.3
1965	354	20.3	11.0	11.0	39.0
Difference 1963-1965		+ 0.5	+ 6.8**	- 7.4*	+ 2.3
1967	373	22.5	10.7	5.6	35.9
Difference 1965-1967		+ 2.2	- 0.3	- 5.4**	- 3.1
Difference 1963-1967		+ 2.7	+ 6.5**	-12.8**	- 1.4
TOTAL SAMPLE	944	21.1	9.3	10.6	37.4

++ Excludes duplicates
* Significant at .05 level
** Significant at .01 level

period under study. This period began in the fall of 1959 when the 1963 graduates entered ninth grade and ended in June of 1967. The discussion which follows will describe arts enrollment during the period in terms of the proportion of students in each of four categories arranged by the number of enrollment units earned in arts subjects during the senior high school years.

The data in Table 22 indicate the percentage of students in the sample by sex and graduating class who enrolled in no arts subjects during their four years in senior high school. Of the 1963 graduates, 18.1 per cent of the boys, 11.9 per cent of the girls and 15.2 per cent of all students fell into this category. Among the 1965 graduates there was no change in the percentage of girls with no arts enrollment units in grades nine through twelve, but there was a 16.7 per cent increase in the proportion of boys in the category. This change was significant at the .01 level of confidence. Consequently, there was an increase, significant at the .05 level, of 7.1 per cent in the proportion of all 1965 graduates in the sample who enrolled in no arts subjects in grades nine through twelve. Additional increases in this category of 9.3 per cent for boys, 5.3 per cent for girls and 16.7 per cent for all students were noted among the 1967 graduates. The percentage increases for boys and for all students were both significant at the .01 level of confidence. Of the total sample, 37.7 per cent of the boys, 13.8

TABLE 22

PER CENT OF SAMPLE BY GRADUATING CLASS AND SEX WITH NO ENROLLMENT UNITS IN ARTS SUBJECTS IN GRADES NINE THROUGH TWELVE

Graduating Class	MALE		FEMALE		TOTAL	
	N	%	N	%	N	%
1963	116	18.1	101	11.9	217	15.2
1965	161	34.8	193	11.9	354	22.3
Difference 1963-1965		+16.7**		0.0		+ 7.1*
1967	204	44.1	169	17.2	373	31.9
Difference 1965-1967		+ 9.3		+ 5.3		+ 9.6**
Difference 1963-1967		+26.0**		+ 5.3		+16.7**
TOTAL SAMPLE	481	34.7	463	13.8	944	24.5

* Significant at .05 level
** Significant at .01 level

per cent of the girls and 24.5 per cent of all students earned no enrollment unit in arts subjects in grades nine through twelve. Thus, almost one-fourth of the students in the High School Sample had no curricular experience in the arts during their entire four years in senior high school.

Table 23 gives comparable data for grades ten through twelve. Grade ten was the level at which arts subjects became completely elective in the three study schools. Therefore, the enrollment percentages given in Table 23 indicate the proportion of students in the sample by sex and graduating class who, for various reasons, elected no arts subjects in grades ten through twelve. Of the 1963 graduates, 44.8 per cent of the boys, 33.6 per cent of the girls, and 39.6 per cent of all students earned no enrollment units in arts subjects during their last three years in senior high school. Boy enrollments in arts subjects diminished with each of the two succeeding graduating classes in the sample to the point that 57.8 per cent of the male 1967 graduates were in this category. This difference of 13.0 per cent during the period was significant at the .05 level of confidence.

By contrast, art enrollment among girls increased slightly during the period under study. Approximately one-third of the 1965 female graduates had no enrollment units in the arts subjects in grades ten through twelve and this proportion diminished to 30.2 per cent for the class of

TABLE 23

PER CENT OF SAMPLE BY GRADUATING CLASS AND SEX WITH NO ENROLLMENT UNITS IN ARTS SUBJECTS IN GRADES TEN THROUGH TWELVE

Graduating Class	MALE N	MALE %	FEMALE N	FEMALE %	TOTAL N	TOTAL %
1963	116	44.8	101	33.6	217	39.6
1965	161	54.7	193	34.2	354	43.5
Difference 1963-1965		+ 9.9		+ 0.6		+ 3.9
1967	204	57.8	169	30.2	373	45.3
Difference 1965-1967		+ 3.1		- 4.0		+ 1.8
Difference 1963-1967		+13.0*		- 3.4		+ 5.7
TOTAL SAMPLE	481	53.6	463	32.6	944	43.3

* Significant at .05 level

1967. There was an over-all increase of 5.7 per cent (from 39.6 per cent to 45.3 per cent) during the period in the proportion of all students who enrolled in no arts subjects in grades ten through twelve. Of the total sample, slightly over half of the boys (53.6 per cent), almost one-third of the girls (32.6 per cent) and 43.3 per cent of all students were in this category.

The data in Tables 22 and 23 regarding the proportion of the High School Sample that had no arts enrollment units in grades nine through twelve or grades ten through twelve could be stated conversely as follows: 75.5 per cent enrolled in arts subjects in grades nine through twelve, and 56.7 per cent enrolled in arts subjects in grades ten through twelve. The difference between these two percentages, 18.8 per cent, represents the proportion of the High School Sample that enrolled in arts subjects at the ninth grade level only. In many instances ninth grade students were enrolled in arts subjects for less than one full enrollment unit--five periods per week for an entire school year. When enrollment was calculated for the 177 students who enrolled in arts subjects in ninth grade only, it was found that 159 of these students earned less than one enrollment unit. This group represented 16.8 per cent of the High School Sample. Thus, while 75.5 per cent of the High School Sample enrolled in arts subjects in grades nine through twelve, only 58.7 per cent of the sample earned as much as one full enrollment unit in arts subjects during the four years of senior high school.

The third enrollment category is represented by the data in Table 24. Students in this category earned some, but less than three, enrollment units in arts subjects in grades ten through twelve. At these grade levels, arts subjects were offered in the study schools for five periods per week for the entire school year. With the exception of a very few students who were enrolled in an arts subject for one semester only, this category represents students who earned either one or two enrollment units in arts subjects in grades ten through twelve. The data in Table 24 reveal that there was a loss during the period in the proportion of both boys and girls which fell into this category. The percentage of boys dropped from 38.8 per cent in the 1963 graduates to 26.7 per cent of the 1965 graduates, a loss of 12.1 per cent which was significant at the .05 level of confidence. A slight gain in the proportion of male students in this enrollment category in 1967, reduced the total loss for the period to 9.3 per cent.

The proportion of female students in the sample who earned some, but less than three, enrollment units in arts subjects in grades ten through twelve dropped from 49.6 per cent of the 1963 graduates to 42 per cent of the 1965 graduates and remained unchanged for the 1967 class. The percentage of all students in this category was 43.8 per

TABLE 24

PER CENT OF SAMPLE BY GRADUATING CLASS AND SEX WITH SOME, BUT LESS THAN THREE, ENROLLMENT UNITS IN ARTS SUBJECTS IN GRADES TEN THROUGH TWELVE

Graduating Class	MALE		FEMALE		TOTAL	
	N	%	N	%	N	%
1963	116	38.8	101	49.6	217	43.8
1965	161	26.7	193	42.0	354	35.0
Difference 1963-1965		-12.1*		- 7.6		- 8.8*
1967	204	29.5	169	42.0	373	35.1
Difference 1965-1967		+ 2.8		0.0		+ 0.1
Difference 1963-1967		- 9.3		- 7.6		- 8.7*
TOTAL SAMPLE	481	30.8	463	43.6	944	37.1

* Significant at .05 level

cent for the 1963 graduates, 35.0 per cent for the 1965 graduates and 35.1 per cent for the 1967 graduates. The net loss for the period was 8.7 per cent and was significant at the .05 level. Of the total sample, 30.8 per cent of the girls, 43.6 per cent of the boys and 37.1 per cent of all students earned some, but less than three, arts enrollment units in grades ten through twelve.

The final enrollment category included students who earned at least three enrollment units in arts subjects in grades ten through twelve. There were 185 students in the High School Sample in this category. None earned more than four enrollment units in arts, and only 36 earned more than three. For the purposes of this study, students who elected three or more enrollment units in arts subjects in grades ten through twelve were classified as "high arts students." Inspection of the data in Table 25 reveals that 16.4 per cent of the male 1963 graduates in the sample fell into this category. There was a slight increase of 2.2 per cent for the the class of 1965 and a decrease of 5.9 per cent for the class of 1967. Thus, there was a decrease during the period of 3.7 per cent in the proportion of boys earning three or more enrollment units in arts subjects in grades ten through twelve, but no definite trend was established.

In contrast to this, there was a definite upward trend of high arts students among the girls in the sample. The proportion of girls in this category was 16.8 per cent

TABLE 25

PER CENT OF SAMPLE BY GRADUATING CLASS AND SEX WITH THREE OR MORE ENROLLMENT UNITS IN ARTS SUBJECTS IN GRADES TEN THROUGH TWELVE

Graduating Class	MALE		FEMALE		TOTAL	
	N	%	N	%	N	%
1963	116	16.4	101	16.8	217	16.6
1965	161	18.6	193	23.8	354	21.5
Difference 1963-1965		+ 2.2		+ 7.0		+ 4.9
1967	204	12.7	169	27.8	373	19.6
Difference 1965-1967		- 5.9		+ 4.0		- 1.9
Difference 1963-1967		- 3.7		+11.0*		+ 3.0
TOTAL SAMPLE	481	15.6	463	23.8	944	19.6

* Significant at .05 level

for the 1963 graduates and 27.8 per cent for the 1967 graduates. This gain of 11.0 per cent during the period was significant at the .05 level of confidence. However, when boys and girls were grouped together, the gain during the period in the proportion of students with high arts enrollment was 3.0 per cent and was not high enough to be statistically significant. Slightly less than one-fifth (19.6 per cent) of the total sample were classified as high arts students, with 15.6 per cent of the boys and 23.8 per cent of the girls in this category.

Summary

The findings related to extent of enrollment by the sample students in high school arts subjects (Research Question One) are summarized in the statements which follow:

1. Three-fourths of the students enrolled in at least one arts subject in grades nine through twelve. However, only 58.5 per cent of the sample earned as much as one full enrollment unit in high school arts subjects during their four years in senior high school.

2. Over half of the students (56.7 per cent) enrolled in at least one arts subject in grades ten through twelve.

3. Very few of the students enrolled in more than one arts subject at any grade level. Simultaneous enrollment in more than one arts subject was almost non-existent in grades ten and eleven and was limited to less than 5 per cent of the sample in grade nine and less than 4 per cent of the sample in grade twelve. No students enrolled in more than two arts subjects at any grade level.

4. Slightly less than one-fifth (19.6 per cent) of the students elected as many as three enrollment units in arts subjects in grades ten through twelve. Only thirty-six students (3.6 per cent of the sample) earned four enrollment units in arts subjects and none earned more.

5. With the exception of a slight increase between grades eleven and twelve, the proportion of students enrolled in arts subjects decreased at each successive senior high grade level. Enrollment percentages were as follows: grade nine, 48.4 per cent; grade ten, 39.5 per cent; grade eleven, 35.8 per cent; grade twelve, 37.4 per cent.

6. More than twice as many students enrolled in music than in art in grade nine, and music enrollments were slightly higher than the combined enrollments for art and drama in grades ten through twelve.

7. The proportion of girls in the sample who enrolled in arts was higher at each grade level than the proportion of boys. The differential was between 16 and 20 per cent in grades nine, ten and eleven and slightly over 8 per cent in grade twelve.

8. The proportion of boys with no enrollment in arts subjects in grades nine through twelve (34.7 per cent) was two and one-half times that of girls (13.8 per cent).

9. The proportion of boys with no enrollment in arts subjects in grades ten through twelve (53.6 per cent) was over one and one-half times that of girls (32.6 per cent).

10. The proportion of girls with high arts enrollment in grades ten through twelve (23.8 per cent) was one and one-half times that of boys (15.6 per cent).

The findings related to trends in enrollment in high school arts subjects during the period under study (Research Question Two) are summarized in the statements which follow:

1. There was a substantial increase during the period in the percentage of students who did not enroll in arts subjects during their four years of senior

high school. This increased 26.0 per cent for boys, 5.3 per cent for girls, and 16.7 per cent for all students. The increases for boys and all students were both significant at well beyond the .01 level of confidence.

2. The percentage of male students who did not elect an arts subject in grades ten through twelve increased by 13 per cent. This increase was significant at the .05 level of confidence. It was partially offset by a decrease of 3.4 per cent during the period in the proportion of female students who failed to elect art subjects.

3. The proportion of students with some, but less than three, enrollment units in arts subjects in grades ten through twelve declined for both male and female students. The net loss of 8.7 per cent during the period in the proportion of students in this category was significant at the .05 level of confidence.

4. There was an increase of 11 per cent in the proportion of female students with high arts enrollment (three or more enrollment units in arts subjects in grades ten through twelve). This increase was significant at the .05 level, but was partially offset by a decrease of 3.7 per cent in the proportion of male students with high arts enrollment.

5. The most severe arts enrollment loss was at the ninth grade level. The decrease of 29.6 per cent during the period in the proportion of students enrolled in ninth grade arts was significant at well beyond the .01 level of confidence.

6. Arts enrollment losses sustained at the ninth grade level were partially offset by gains at the tenth grade level. There was a 14.2 per cent gain in the proportion of female students enrolled in tenth grade arts subjects. This gain was significant at the .05 level of confidence. However, the proportion of male students enrolled in tenth grade arts declined by 2.1 per cent. The proportion of all students enrolled in tenth grade arts increased by 5.2 per cent during the period, but this gain was not significant at the .05 level of confidence.

7. There was a 14.9 per cent decrease in the proportion of eleventh grade boys enrolled in arts subjects during the period. This decrease was

significant at the .01 level of confidence. There was almost no change in the percentage of eleventh grade girls enrolled in arts subjects, but the decline of 8.8 per cent during the period in the proportion of all students enrolled in eleventh grade arts was also significant at the .01 level of confidence.

8. There was no significant change during the period in the percentage of students enrolled in arts at the twelfth grade level.

9. The decline in the proportion of students enrolled in ninth grade music was significant at the .01 level for male students and all students and at the .05 level for female students. There were no significant changes during the period in the proportion of male, female, or all students enrolled in music in grades ten, eleven, or twelve.

10. The decline in the proportion of students enrolled in ninth grade art was significant at the .01 level for male students and all students and at the .05 level for female students. The decline in the proportion of male students enrolled in tenth grade art was significant at the .05 level, and there were no significant changes during the period in grades eleven and twelve.

11. There were small increases during the period in the percentages of female students enrolled in art in grades ten and eleven. The increase of 11.8 per cent in the proportion of female students enrolled in twelfth grade art was significant at the .01 level of confidence. An increase of 6.5 per cent in the proportion of all students enrolled in art at the twelfth grade level was also significant at the .01 level.

12. There were small increases during the period in the proportion of male, female, and all students enrolled in drama at the tenth grade level. However, drama suffered heavy enrollment losses at the eleventh and twelfth grade levels. The decline in the proportion of male students and all students enrolled in drama was significant at the .01 level in both the eleventh and twelfth grades. The decline in the proportion of female students enrolled was almost significant at the .05 level for eleventh grade drama and was significant at that level for twelfth grade drama.

The findings related to Research Question Two give some evidence of a trend of diminishing enrollment in high school arts subjects during the period under study. The trend was especially marked at the ninth grade level where enrollment losses were significant at well beyond the .01 level of confidence for both male and female students. Significant losses in male student enrollment were also registered at the eleventh grade level and smaller losses were found at grades ten and twelve.

Relations to Enrollment Trends in Other Subjects

Since the period covered by this study, 1959-1967, was characterized as one in which heavy emphasis was placed upon academic subjects, the assumption might be made that enrollment losses in arts subjects were paralleled by corresponding increases in enrollment in academic subjects. As the data which follow indicate, this was not the case. There was actually a decrease during the period in the mean number of total units earned in academic subjects by both male and female students in the sample drawn for this study.

Mean Number of Academic Subject Units

Graduating Class	Male Students	Female Students
1963	18.76	19.28
1965	18.71	18.93
1967	18.70	18.90

The mean number of academic subject units earned diminished during the period by .06 of a unit for male students and .38 of a unit for female students. Since there was no change during the period in either the amount of unit credit allowed for academic subjects or the number of periods in the school day, it must be assumed that the losses in the mean number of credit units earned in academic subjects were paralleled by a gain in the mean number of enrollment units earned in non-academic subjects. It must further be assumed that enrollment losses in arts subjects were paralleled by enrollment gains in other non-academic subjects. These enrollment gains could be due to an increase in the proportion of students enrolled, in an increase in the number of periods devoted per week to the subject, or to both of these factors.

The mean number of enrollment units earned in non-academic subjects was computed at the grade levels for which there were losses in arts enrollment during the period. These were grades nine for both male and female students and grades ten through twelve for male students. It will be recalled that total arts enrollment by female students gained significantly during the period in grade ten, remained unchanged at grade eleven, and increased slightly at grade twelve. (see Tables 14, 17, and 20).

Industrial arts, home economics, and physical education were the non-arts elective subjects available to ninth grade students in the three schools from which the High School Sample was drawn. During the period covered by this study, there was a loss of .098 of a unit in mean number of enrollment units earned by boys in ninth grade industrial arts and .016 of a unit in mean number of units earned by girls in ninth grade home economics. In contrast to this, there was a gain during the period of .329 of a unit for boys and .177 of a unit for girls in mean number of enrollment units earned in ninth grade physical education. These losses and gains were calculated by comparing the mean number of enrollment units earned in the subject by students who graduated from high school in 1963 with that for students who graduated in 1967.

No gains were registered during the period in mean number of units earned in ninth grade academic subjects. Consequently, it must be assumed that the major portion of the loss in arts enrollment at the ninth grade level was accounted for by corresponding gains in physical education enrollment.

The figures which follow show gains and losses during the period in mean number of enrollment units earned by male students in non-arts, non-academic subjects in grades ten through twelve.

	Subject Area Grades 10-12	Mean Number of Enrollment Units	
		Gain	Loss
1.	Industrial Arts	.057	
2.	Drafting		.209
3.	Typing		.036
4.	Physical Education	.442	
5.	Business Education		.075

There was a gain during the period of over 0.4 of an enrollment unit in mean number of enrollment units earned in physical education in grades ten through twelve by male students in the sample. This would appear to account for a large portion of the enrollment loss incurred in arts enrollment by male students in these grades. Since gains in physical education enrollments appeared to be related to losses in arts enrollments during the period under study, the percentage enrollments in physical education were calculated for the High School Sample. The results of these calculations are given in Tables 26, 27, and 28. As indicated in Table 26, the proportion of male students enrolled in ninth grade physical education increased from 76.7 per cent to 90.7 per cent during the period. This gain of 14.0 per cent was significant at the .01 level of confidence.

Though the proportion of male students who enrolled in physical education was much smaller past the ninth grade level, there were also significant gains during the period in the proportion of male students enrolled in physical

TABLE 26

PER CENT OF MALE STUDENTS IN SAMPLE BY GRADUATING CLASS AND GRADE LEVEL ENROLLED IN PHYSICAL EDUCATION

Graduating Class	N	Grade Level 9	10	11	12
1963	116	76.7	28.5	23.3	23.3
1965	161	83.2	39.8	24.8	31.1
Difference 1963-1965		+ 6.5	+11.3	+ 1.5	+ 7.8
1967	204	90.7	43.1	38.7	36.8
Difference 1965-1967		+ 7.5*	+ 3.3	+13.9**	+ 5.7
Difference 1963-1967		+14.0**	+14.6*	+15.4**	+13.5*
TOTAL SAMPLE (MALE)	481	84.8	38.5	32.4	31.6

* Significant at .05 level
** Significant at .01 level

education at grades ten, eleven, and twelve. Tenth grade enrollment increased from 28.5 per cent to 43.1 per cent, a gain of 14.6 per cent which was significant at the .05 level. The gain of 15.4 per cent in the proportion of male enrollment in eleventh grade physical education was significant at the .01 level of confidence. This percentage increase closely paralleled the decrease during the period of 14.9 per cent in the proportion of eleventh grade boys enrolled in arts subjects (see Table 16). At the twelfth grade level, the increase of 13.5 per cent in the proportion of male students enrolled in physical education was significant at the .05 level of confidence.

The data in Table 27 indicate that the marked trend during the period of increasing enrollment in physical education by male students at each grade level was not duplicated by the female students in the sample. There was a slight increase in the proportion of female students who enrolled in tenth grade physical education and small decreases during the period in grades nine, eleven, and twelve. The decline of 3.7 per cent in proportion of female students enrolled in ninth grade physical education would appear to contradict the finding reported earlier that there was a gain during the period of .177 of an enrollment unit in the mean number of physical education enrollment units earned by female ninth grade students. This can be explained by the fact that there was a definite

TABLE 27

PER CENT OF FEMALE STUDENTS IN SAMPLE BY GRADUATING CLASS AND GRADE LEVEL ENROLLED IN PHYSICAL EDUCATION

Graduating Class	N	Grade Level 9	10	11	12
1963	101	84.2	14.9	10.9	14.9
1965	193	78.2	23.3	19.2	18.7
Difference 1963-1965		- 6.0	+ 8.4	+ 8.3	+ 3.8
1967	169	80.5	16.0	9.5	12.4
Difference 1965-1967		+ 2.3	- 7.3	- 9.7**	- 6.3
Difference 1963-1967		- 3.7	+ 1.1	- 1.4	- 2.5
TOTAL SAMPLE (FEMALE)	463	80.4	18.8	13.8	15.6

** Significant at .01 level

trend during the period toward placing all ninth grade non-academic subjects on a schedule of five periods per week. Whereas most of the students who graduated in 1963 took three periods per week of physical education in ninth grade, most of the 1967 graduates who enrolled in ninth grade physical education were scheduled for five periods per week. The effect of this shift toward daily classes for ninth grade non-academic subjects upon the elective program of studies will be discussed more fully in Chapter VII. The change in scheduling procedures did mean that, as was the case with ninth grade female physical education, a smaller percentage of students could earn a larger number of enrollment units with a resultant increase in the mean number of enrollment units earned in the subject by the student group as a whole.

The data in Table 28 indicate that there was an increase during the period under study in the proportion of all students that enrolled in physical education at each of the four grade levels in senior high school. The increases of 8.7 per cent at the tenth grade level and 8.0 per cent at the eleventh grade level were both significant at the .05 level of confidence. With the exception of the small percentage increase in female physical education enrollment at the tenth grade level, the increases in the proportion of the sample students enrolled in physical education were due to the increased enrollment of male students during the period.

TABLE 28

PER CENT OF ALL STUDENTS IN SAMPLE BY GRADUATING CLASS AND GRADE LEVEL ENROLLED IN PHYSICAL EDUCATION

Graduating Class	N	Grade Level			
		9	10	11	12
1963	217	80.2	22.1	17.5	19.4
1965	354	80.5	30.8	21.8	24.3
Difference 1963-1965		+ 0.3	+ 8.7*	+ 4.3	+ 4.9
1967	373	86.1	30.8	25.5	25.7
Difference 1965-1967		+ 5.9*	0.0	+ 3.7	+ 1.4
Difference 1963-1967		+ 5.9	+ 8.7*	+ 8.0*	+ 6.3
TOTAL SAMPLE	944	82.6	28.8	22.3	23.7

* Significant at .05 level

In summary, while there was evidence of a trend during the period under study of decreasing enrollment by the sample students in arts subjects, enrollment losses were not evenly distributed throughout the four senior high school grade levels and were more pronounced among male than among female students. Furthermore, there was no evidence to indicate that loss in arts enrollment was due to increased enrollment in academic subjects. The only significant loss in female arts enrollment occurred in grade nine, and this was due to a change during the period in scheduling procedures which permitted most college preparatory students to enroll in only one ninth grade non-academic subject. This factor accounted for part of the heavy loss in ninth grade male enrollment in arts subjects, but the major portion of the loss was due to increased male enrollment in physical education. Increased physical education enrollment also largely accounted for the significant loss during the period in male enrollment in eleventh grade arts subjects. There were significant gains during the period in the proportion of female students who enrolled in tenth grade arts subjects in grades ten through twelve.

In view of the relationship which was evident during the period between enrollment patterns in physical education and arts subjects, a decision was made to inject level of enrollment in high school physical education as an additional predictor variable in the regression anlaysis procedure to determine if it had a significant effect upon college grade point average in academic subjects. As with arts subjects, students who earned three or more enrollment units in physical education in grades ten through twelve were classified as having a high level of enrollment. This procedure provided a basis for comparing the relationships between level of enrollment in two high school non-academic subject areas, arts and physical education, and college GPA in academic subjects. Similar comparisons involving other high school non-academic subject areas were not feasible, due to the small number of students in the High School Sample with high levels of enrollment in these subjects.

II. COMPARISON OF HIGH ARTS STUDENTS WITH OTHER STUDENTS

The comparison of high arts students--those who earned three or more enrollment units in arts subjects in grades ten through twelve--with other students was based upon Research Question Three which was stated as follows:

> Do students with high enrollment in high school arts subjects differ from other students in the variables listed below?
>
> a. Sex
> b. I.Q.
> c. Quintile rank in high school graduating class
> d. Grade point average in high school academic subjects
> e. Number of credits earned in high school academic subjects
> f. Total number of high school credits earned
> g. Per cent withdrawing from college

h. Per cent entering college
i. Selection of college fields of study
j. Enrollment in college arts subjects

The data in Table 29 compares high arts students with other students on the basis of the first six variables listed under Research Question Three. The high arts group was composed of 18.0 per cent more girls than boys, whereas there were 6.0 per cent more boys than girls in the portion of the High School Sample composed of all other students. There was very little difference between the two groups in mean I.Q., as measured by the "Otis Quick Scoring Test of Mental Ability" which was administered in tenth grade to all students in the High School Sample. The mean I.Q. was 115.77 for high arts students and 116.30 for all other students.

The third variable in Table 29 compares the mean quintile rank in graduating class for the two groups. The quintile rank in graduating class provides a rough measure of scholastic achievement by placing all students within a given graduating class into one of five groupings according to their total grade average for all subjects in grades nine through twelve. The twenty per cent with the highest grade point averages are assigned to the first quintile, and the twenty per cent with the lowest grade point averages are assigned to the fifth quintile. Thus, the mean quintile rank for any given graduating class would be 2.50. As indicated in Table 29, both groups in the High School Sample surpassed this mean. The mean quintile rank was 2.15 for the high

TABLE 29

COMPARISON OF HIGH ARTS STUDENTS WITH OTHER STUDENTS ON THE BASIS OF SIX VARIABLES

Variables	High Arts Students N = 185	Other Students N = 759
1. Sex		
a. Per cent male	41.0	53.0
b. Per cent female	59.0	47.0
2. Mean Otis I. Q.	115.77	116.30
3. Mean Quintile Rank in Graduating Class	2.15	2.28
4. Mean grade point average in academic subjects	2.49	2.52
5. Mean number of credits earned in academic subjects	18.31	18.99
6. Mean number of total credits earned	22.10	22.06

arts students as a group had a slightly higher overall scholastic average in senior high school than other students. It must be remembered, however, that averages for rank in graduating class are computed on the basis of grades earned in both academic and non-academic subjects. Further, the quintile rankings are based upon the scholastic averages of all students graduating from a particular high school in a particular year.

Variable five in Table 29, mean grade point average in academic subjects, was derived from grade point averages earned in academic subjects only by students in the High School Sample. There was a very small difference between the two groups, with the high arts students earning a mean grade point average of 2.49 and the other students earning a mean grade point average of 2.52. The mean number of high school credits earned in academic subjects was 18.31 for the high arts group and 18.99 for other students, indicating that as a group, the high arts students enrolled in somewhat fewer academic subjects than did other students. There was almost no difference, however, between the two groups in the mean number of total credits earned in high school. The high arts students earned a mean of 22.10 credits, and the mean for other students was 22.06 credits.

The last four variables listed under Research Question Three compare high arts students with other students on the basis of the proportion of each group which entered college, the proportion which withdrew from college, their selection of collegiate fields of study and their enrollment in college arts subjects. It will be recalled from the description of the study population in Chapter IV that the group designated as the College Sample was composed of 364 students who graduated from high school in either June of 1963 or June of 1965 and were enrolled as full-time students in either an accredited four-year college or university or in a college transfer curriculum at Harford Junior College. Students who entered college in the fall of 1963 and attended college for eight semesters, or else entered college in the fall of 1965 and attended for four semesters, were classified as continuous enrollment students. Other students in the College Sample who did not meet this criterion were classified as withdrawal students.

The data outlined below compare students with high enrollment in high school arts subjects with other students on the basis of the percentages of each group which entered and withdrew from college.

		High Arts Students	Other Students
1.	Number of 1963 and 1965 graduates	112	459
2.	Number entering college	69	295
3.	Per cent entering college	61.6	64.3
4.	Number withdrawing from college	24	103
5.	Per cent withdrawing from college	34.8	34.9

There was very little difference between the two groups in either the proportion which entered or the proportion which withdrew from college. Less than two-thirds of either group attended college, with 61.6 per cent of the high arts students classified as college entrants, compared to 64.3 per cent of other students. Slightly over one-third of the students in each group who entered college later withdrew, with 34.8 per cent of the high arts students and 34.9 per cent of the other students classified as withdrawals from college. Neither the 2.7 per cent differential between the two groups in proportion attending college nor the .01 per cent differential in proportion withdrawing was statistically significant.

The comparison of high arts students with other students on the basis of major and minor fields selected for college study was confined to that portion of the sample which had completed eight semesters of college. For the purposes of this study, a major field of study was defined as one in which the student earned at least thirty semester hours of college credit. A minor field was defined as one in which the student earned at least twenty, but less than thirty semester hours of credit. Table 30 shows the number and percentage of the thirteen high arts students and the sixty other students who selected various major fields of study, and Table 31 presents similar data for minor fields of study. The small size of this sample, particularly the

the portion represented by high arts students, makes it difficult to draw precise comparisons between the two groups. With this limitation in mind, several observations and tentative conclusions can be drawn from the data in Tables 30 and 31.

Only one of the high arts students majored in an arts subject (art) in college. There were no music or drama majors in either group. Two students who were not classified as high arts students majored in arts-related fields; one in design and another in architecture. College majors in arts and arts-related fields of study represented 7.7 per cent of the high arts students and 3.4 per cent of the other students. None of the high arts students in the sample minored in an arts or arts-related field of study, while one each of the other students minored in music, architecture, and design. These three students represented 5.1 per cent of the group not classified as high arts students. Of the seventy-three students from the College Sample who completed eight semesters of college, only six, or less than ten per cent, selected an arts or arts-related subject as either a major or minor field of study. So far as the student sample selected for this study is concerned, it would appear that the vast majority of the college preparatory students who enrolled in high school arts subjects planned to concentrate their collegiate studies in non-arts subject fields. It would also appear that the student who does

TABLE 30

MAJOR FIELDS OF STUDY SELECTED BY HIGH ARTS AND OTHER STUDENTS WITH EIGHT SEMESTERS OF COLLEGE

Fields of Study	High Arts Students N = 13 No.	%	Other Students N = 60 No.	%
A. Five Academic				
1. English-Journalism	3	23.0	5	8.3
2. Social Science	6	46.2	23	38.3
3. Science-Engineering	4	30.8	16	26.7
4. Mathematics			2	3.3
5. Foreign Language			2	3.3
B. Arts and Arts Related				
1. Art	1	7.7		
2. Music				
3. Architecture			1	1.7
4. Design			1	1.7
C. Education	1	1.7	6	10.0
D. Other				
1. Business			6	10.0
2. Physical Education			2	3.3
3. Home Economics			3	5.0
4. Philosophy-Religion				
Total including duplicates	15	115.4	67	111.6
Duplicates	2	15.4	7	11.6
Total excluding duplicates	13	100.0	60	100.0

TABLE 31

MINOR FIELDS OF STUDY SELECTED BY HIGH ARTS AND OTHER STUDENTS WITH EIGHT SEMESTERS OF COLLEGE

Fields of Study	High Arts Students N = 13 No.	High Arts Students N = 13 %	Other Students N = 60 No.	Other Students N = 60 %
A. Five Academic				
1. English-Journalism	1	7.7	4	6.6
2. Social Science			7	11.6
3. Science-Engineering			2	3.3
4. Mathematics	2	15.4	9	15.0
5. Foreign Language	1	7.7	1	1.7
B. Arts and Arts Related				
1. Art				
2. Music			1	1.7
3. Architecture			1	1.7
4. Design			1	1.7
C. Education	3	23.0	10	16.7
D. Other				
1. Business			1	1.7
2. Physical Education				
3. Home Economics				
4. Philosophy-Religion			3	5.0
Total including duplicates	7	53.8	40	66.7
Duplicates	0	0.0	8	13.3
Total excluding duplicates	7	53.8	32	53.4
No minor field	6	46.2	28	46.6
TOTAL	13	100.0	60	100.0

select an arts or arts-related subject for either his major or minor field of study in college does not necessarily have a high level of enrollment in high school arts subjects.

With the exception of the single student majoring in art, all of the students with high arts enrollment in high school majored in college subjects which were closely related to the five high academic subject areas. One of the high arts students majored in Education, but this student also had a major in social studies. Students with double majors or double minors are termed "duplicates" in Table 30 and 31. The proportion of high arts students who majored in academic subjects (92.3 per cent) was greater than the proportion of other students (79.9 per cent) majoring in these fields. With the possible exception of English and journalism, there was little difference between the college fields of study selected by high arts students and other students. Of the high arts students, 23.0 per cent majored in English or journalism, while only 8.3 per cent of the other students concentrated in these fields. Social science attracted the largest proportion of both groups, with 46.2 per cent of high arts group and 38.3 per cent of the other students majoring in one of the social sciences. There were no social science minors among the high arts group, while 11.6 per cent of the other students minored in the field.

The assumption is sometimes made that students with high interest in the arts are less likely to be interested in science and mathematics. This assumption was not valid for the students from the sample drawn for this study. The proportion of high arts students majoring in science and engineering was 30.8 per cent, compared to 26.7 per cent of the other students. There were no mathematics majors among the high arts students; however, only two of the other students majored in this field. The proportion of both groups minoring in mathematics was identical at 15 per cent each.

There were even fewer students who selected foreign languages as a major or minor field of study than was the case with arts and arts-related subjects. None of the high arts students majored in this area and one student, representing 7.7 per cent of the group, minored in foreign language. Two, or 3.3 per cent, of the other students were foreign language majors and one student, representing 1.7 per cent of the group, minored in the field.

The final variable used as a basis for comparing high arts students with other students was extent of enrollment in college arts subjects. Table 32 shows the distribution of the seventy-three students in the College Sample who completed four years of college by level of enrollment in college arts. Included were thirteen students with high arts enrollment in high school and sixty other students. The percentage of each group that enrolled in at least one college arts subject was almost identical at 61.6 per cent

TABLE 32

DISTRIBUTION OF STUDENTS WITH FOUR YEARS OF COLLEGE BY NUMBER OF SEMESTER HOURS EARNED IN COLLEGE ARTS SUBJECTS

Semester Hours	High Arts Students N = 13		Other Students N = 60		All Students N = 73	
	No.	%	No.	%	No.	%
1 - 6	4	30.7	21	35.0	25	34.3
7 - 12	1	7.7	7	11.7	8	10.9
over 12	3	23.1	9	15.0	12	16.4
TOTAL	8	61.5	37	61.7	45	61.6

for high arts students and 61.7 per cent for other students. As can be seen from the data in Table 32, there were some differences between the two groups in number of semester hours earned in college arts subjects. Of the high arts students, 7.7 per cent earned from seven to twelve semester hours in college arts, compared to 11.7 per cent of the other students. Also, 23.1 per cent of the high arts students earned more than twelve semester hours in college arts, compared to 15 per cent of the other students. However, since the number of high arts students (thirteen) in this portion of the sample is so small, it is difficult to attach much significance to differences between the two groups in number of semester hours earned in college arts subjects.

Somewhat larger population groupings were obtained by computing enrollment in arts subjects for the first two years of college only. There were 267 students in the College Sample who completed at least two years of college. Of these, 50 were classified as high arts students and 217 as other students on the basis of their high school enrollment in arts subjects. Table 33 gives the distribution of students with two years of college by number of semester hours earned in arts subjects. Just over half (50.6 per cent) of all students with two years of college enrolled in at least one college arts course. A higher percentage (68 per cent) of the high arts students were in this category than other

TABLE 33

DISTRIBUTION OF STUDENTS WITH TWO YEARS OF COLLEGE BY NUMBER OF SEMESTER HOURS EARNED IN COLLEGE ARTS SUBJECTS

Student Category	Semester Hours Earned 1-6		over 6		Total	
	No.	%	No.	%	No.	%
ALL STUDENTS						
1963 Grads. N=103	30	29.1	11	10.6	41	39.7
1965 Grads. N=164	70	42.7	24	14.7	94	57.4
Total N=267	100	37.5	35	13.1	135	50.6
HIGH ARTS STUDENTS						
1963 Grads. N=18	6	33.3	4	22.3	10	55.6
1965 Grads. N=32	12	37.5	12	37.5	24	75.0
Total N=50	18	36.0	16	32.0	34	68.0
OTHER STUDENTS						
1963 Grads. N= 85	24	28.4	7	8.3	31	36.5
1965 Grads. N=132	58	43.9	12	9.2	70	53.1
Total N=217	82	37.8	19	8.8	101	46.6

students (46.6 per cent). This difference of 21.4 per cent was significant at the .01 level of confidence. The high arts students also earned more semester hours of credit in college arts than did other students. Of the high arts students, 32 per cent earned more than six college semester hours in arts subjects, compared to 8.8 per cent of the other students. This difference of 23.2 per cent was also significant at the .01 level of confidence.

A comparison of the data in Table 33 for 1963 and 1965 high school graduates gives evidence of an upward trend in arts enrollment during the first two years of college. Slightly less than 40 per cent of the 1963 graduates enrolled in at least one college arts course during their first two years of college. This increased to 57.4 per cent with the 1965 graduates and the difference of 17.7 per cent was significant at the .01 level of confidence. Of the high arts 1963 graduates, 55.6 per cent enrolled in at least one first or second year college arts course, and this increased to 75.0 per cent with the 1965 graduates. However, due to the small size of the high arts student portion of the sample, this increase of 19.1 per cent was not significant at the .05 level of confidence. The proportion of other students who enrolled in at least one arts course during their first two years of college increased from 36.5 per cent of the 1963 graduates to 53.1 per cent of the 1965 graduates. This increase of 16.6 per cent was found to be significant at the .05 level. A greater proportion of the 1965 graduates also earned more than six semester hours in arts subjects during their first two years of college. None of the percentage gains, however, was large enough to be significant at the .05 level of confidence.

The gain in proportion of students enrolling in at least one first or second year college arts course was not offset by a corresponding decrease in the percentage of students earning more than six semester hours in college arts subjects during the first two years of college. The proportion of high arts students in this category increased from 22.3 per cent of the 1963 graduates to 37.5 of the 1965 graduates. Again, due to the small size of the high arts student sample, this gain was not significant at the .05 level of confidence. The proportion of other students who earned more than six semester hours in first or second year college arts subjects was almost the same, approximately 9.0 per cent, for both the 1963 and 1965 graduates.

In summary, major differences between students with high enrollment in high school arts subjects and other students were limited to two variables. The high arts group included a higher percentage (18 per cent) of female students, and these students enrolled in a significantly greater number of arts courses in college despite the fact that only a very small proportion of either group selected the arts as either a major or minor field of college study. There were no significant differences between high arts students and other students in mean I.Q., mean grade point average in high school academic subjects, or total number of credits earned toward high school graduation. High arts students had a slightly higher mean quintile rank in high school graduating class, and other students earned an average of two-thirds of a credit more in high school academic subjects.

There was very little difference between the two groups in the proportion of each who entered or the proportion who withdrew from college. No significant differences were found between the two groups in the selection of major and minor fields of college study, with the possible exception of the fact that a larger proportion of high arts students majored in English and journalism and a larger proportion of other students majored in non-academic subject areas in colleges. The findings related to the selection of college fields of study were somewhat inconclusive due to the relatively small size of the portion of College Sample who completed eight semesters of college. The findings also revealed that there was a significant increase during the period under study in the proportion of students in the College Sample who enrolled in college arts courses during their first two years of college.

III. RELATIONSHIP BETWEEN ENROLLMENT LEVEL IN ARTS AND HIGH SCHOOL ACADEMIC GPA

The relationship between enrollment level in high school arts subjects and high school academic GPA was examined as a means of answering Research Question Four which was stated as follows:

> When I.Q. and sex variables are controlled, is there a significant relationship between level of enrollment in high school arts subjects and grade point average in high school academic subjects?

Table 34 indicates the results of the regression analysis performed to indicate the effectiveness of level of enrollment in high school arts subjects as a predictor of grade point average in high school academic subjects when the variables I.Q. and sex of student are controlled. The probability statistic of .6443 in Table 35 indicates that in better than 64 cases out of 100, any differences in grade point average in high school academic subjects were due to chance, rather than to level of enrollment in high school arts subjects. Thus, no relationship was found between level of enrollment in high school arts subjects and grade point average in high school academic subjects. It can be assumed, therefore, that the high school academic achievement of students in the sample who had a high level of enrollment in arts subjects was affected in neither a positive nor negative manner by the fact that these students elected three or more enrollment units in arts subjects during their last three years of high school.

TABLE 34

ANALYSIS OF THE EFFECT OF ENROLLMENT LEVEL IN HIGH SCHOOL ARTS ON HIGH SCHOOL GPA IN ACADEMIC SUBJECTS WHEN I.Q. AND SEX VARIABLES ARE CONTROLLED

Predictor Variables

1. Unit Vector
2. I.Q. (Otis)
3. Sex
4. High level of enrollment in high school arts
5. Other than high level of enrollment in high school arts

Variables	No. Var.	RSQ	F-Ratio	df_1	df_2	Probability
Full Model	5	.3784				
Restricted Model (all variables except 4 and 5)	3	.3778	0.4463	2	940	.6443

IV. RELATIONSHIPS BETWEEN ENROLLMENT LEVEL IN HIGH SCHOOL ARTS AND GPA IN COLLEGE ACADEMIC SUBJECTS

The results of the regression analyses performed to determine the effect of selected predictor variables upon college grade point average (GPA) in each of five academic subject areas, and upon the composite GPA earned in all five areas are summarized in Tables 35 and 36. Table 35 summarizes the results for students with continuous enrollment in college. The detailed results of the regression analyses for continuous enrollment students are given in Tables 42 through 47 in Appendix C. Table 36 summarizes results of the regression analyses for students who withdrew from college, and the detailed results for this group are given in Tables 48 through 53 in Appendix C. Part A-4 of Table 35 and Part A-3 of Table 36 summarize the results of the analyses performed to answer Research Question Five which was stated as follows:

> When I.Q. and sex variables are controlled, is there a significant relationship between level of enrollment in high school arts subjects and grade point average in college academic subjects?

At this point reference will be made only to the relationship between level in high school arts and college GPA in academic subjects when other variables included in the Full Regression Models were controlled. Enrollment level is listed as variable 4 in Table 35 and variable 3 in Table 36. For the sake of brevity, the statement, "when other variables are controlled," will be implied rather than stated each time a relationship is described between level of enrollment in high school arts and GPA in college academic subjects. This same procedure will be followed in Section V of this chapter which will report the relationships found between level of enrollment in physical education and GPA in college academic subjects, and again in Section VI which will report the relationships found between level of enrollment in high school academic subjects and college GPA in these subjects.

As is indicated in Part A-4 of Table 35 and Part A-3 of Table 36, no significant relationship was found between level of enrollment in high school arts subjects and GPA in academic subjects for students with continuous enrollment in college or for students who withdrew from college. This was true for GPA in each of the five academic subjects areas, as well as for the composite GPA in these subjects. Thus, so far as the sample drawn for this study was concerned, the college academic achievement of students who earned three or more enrollment units in arts subjects during their last three years of high school was neither greater or less than that of other students. The probability of a chance relationship between level of enrollment in arts subjects and the composite GPA in academic subjects was high, with $\underline{p}$ values of .3525 for students with continuous enrollment in college (see Table 42) and .6406 for students who withdrew from college (see Table 48).

TABLE 35

SIGNIFICANCE OF EFFECT OF PREDICTOR VARIABLES UPON COLLEGE GPA IN ACADEMIC SUBJECTS FOR STUDENTS WITH CONTINUOUS ENROLLMENT IN COLLEGE

Key: NS - not significant
* - significant at .05 level of confidence
** - significant at .01 level of confidence

High School Subjects and Predictor Variables	COLLEGE GPA Eng.	Soc. Sci.	Sci.	Math	For. Lang.	Composite
A. ARTS						
1. I.Q.	**	NS	NS	**	**	**
2. Sex	NS	NS	NS	NS	NS	NS
3. No. semesters in college (4 or 8)	NS	NS	NS	NS	NS	NS
4. Enrollment Level High - N= 45 Others - N=192	NS	NS	NS	NS	NS	NS
B. PHYSICAL EDUCATION						
1. I.Q.	**	NS	NS	**	**	**
2. Sex	NS	NS	NS	NS	NS	NS
3. No. Semesters in college (4 or 8)	NS	NS	NS	NS	NS	NS
4. Enrollment Level High - N= 20 Others - N-217	**	NS	NS	NS	NS	NS

TABLE 35 (continued)

High School Subjects and Predictor Variables	COLLEGE GPA Eng.	Soc. Sci.	Sci.	Math	For. Lang.	Composite
C. ENGLISH						
1. I.Q.	**	NS	NS	**	**	**
2. Sex	NS	NS	NS	NS	NS	NS
3. No.Semesters in college (4 or 8)	NS	NS	NS	NS	NS	NS
4. Enrollment Level High - N= 67 Others - N=170	NS	NS	NS	NS	NS	NS
D. SOCIAL STUDIES						
1. I.Q.	**	NS	NS	**	**	**
2. Sex	NS	NS	NS	NS	NS	NS
3. No.Semesters in college (4 or 8)	NS	NS	NS	NS	NS	NS
4. Enrollment Level High - N= 62 Others - N=175	NS	NS	NS	NS	NS	NS
E. SCIENCE						
1. I.Q.	**	NS	NS	**	**	**
2. Sex	NS	NS	NS	NS	NS	NS
3. No.Semesters in college (4 or 8)	NS	NS	NS	NS	NS	NS
4. Enrollment Level High - N=160 Others - N= 77	NS	NS	NS	NS	NS	NS

TABLE 35 (continued)

High School Subjects and Predictor Variables	COLLEGE GPA Eng.	Soc. Sci.	Sci.	Math	For. Lang.	Composite
F. MATHEMATICS						
1. I.Q.	**	NS	NS	NS	**	**
2. Sex	*	NS	NS	NS	NS	NS
3. No.Semesters in college (4 or 8)	NS	NS	NS	NS	NS	NS
4. Enrollment Level High - N=163 Others - N= 74	NS	NS	*	**	NS	NS
G. FOREIGN LANGUAGE						
1. I.Q.	**	NS	NS	**	*	**
2. Sex	NS	NS	NS	NS	NS	NS
3. No.Semesters in college (4 or 8)	NS	NS	NS	NS	*	NS
4. Enrollment Level High - N=128 Others - N=109	**	NS	NS	NS	**	*

TABLE 36

SIGNIFICANCE OF EFFECT OF PREDICTOR VARIABLES UPON COLLEGE GPA IN ACADEMIC SUBJECTS FOR STUDENTS WHO WITHDREW FROM COLLEGE

Key: NS - not significant
* - significant at .05 level of confidence
** - significant at .01 level of confidence

High School Subjects and Predictor Variables	COLLEGE GPA Eng.	Soc. Sci.	Sci.	Math	For. Lang.	Composite
A. ARTS						
1. I.Q.	*	NS	NS	**	**	**
2. Sex	**	NS	NS	NS	**	NS
3. Enrollment Level High - N= 24 Others - N=103	NS	NS	NS	NS	NS	NS
B. PHYSICAL EDUCATION						
1. I.Q.	*	NS	NS	**	*	**
2. Sex	**	NS	NS	NS	**	NS
3. Enrollment Level High - N= 20 Others - N=107	NS	NS	NS	NS	NS	NS

TABLE 36 (continued)

High School Subjects and Predictor Variables	COLLEGE GPA Eng.	Soc. Sci.	Sci.	Math	For. Lang.	Composite
C. ENGLISH						
1. I.Q.	*	NS	NS	*	*	*
2. Sex	*	NS	NS	NS	**	NS
3. Enrollment Level High - N= 23 Others - N=104	NS	NS	NS	NS	NS	NS
D. SOCIAL STUDIES						
1. I.Q.	*	NS	NS	**	**	**
2. Sex	**	NS	NS	NS	**	NS
3. Enrollment Level High - N= 40 Others - N= 87	NS	NS	NS	NS	NS	NS
E. SCIENCE						
1. I.Q.	**	NS	NS	**	**	**
2. Sex	**	NS	NS	NS	*	NS
3. Enrollment Level High - N= 76 Others - N= 51	NS	NS	NS	NS	NS	NS

TABLE 36 (continued)

	COLLEGE GPA					
High School Subjects and Predictor Variables	Eng.	Soc. Sci.	Sci.	Math	For. Lang.	Composite
F. MATHEMATICS						
1. I.Q.	*	NS	NS	*	*	*
2. Sex	**	NS	NS	NS	**	*
3. Enrollment Level High - N= 71 Others - N= 56	NS	NS	**	*	NS	NS
G. FOREIGN LANGUAGE						
1. I.Q.	**	NS	NS	**	*	**
2. Sex	**	NS	NS	NS	**	*
3. Enrollment Level High - N= 49 Others - N= 78	NS	NS	NS	NS	NS	NS

V. RELATIONSHIPS BETWEEN ENROLLMENT LEVEL IN HIGH SCHOOL PHYSICAL EDUCATION AND GPA IN COLLEGE ACADEMIC SUBJECTS

Part B of Tables 35 and 36 summarizes the analyses performed to determine the relationship between level of enrollment in high school physical education and college GPA in academic subjects. As was stated earlier, this relationship was injected into the research design as a result of the finding that enrollment losses in high school arts subjects during the period under study were, in some instances, paralleled by enrollment gains in physical education.

The data in Part B-3 of Table 35 shows a relationship which was significant at the .01 level of confidence between level of enrollment in high school physical education and GPA in English for college students with continuous enrollment. Standard weights assigned in the regression analysis were -.1519 for students with high enrollment in physical education and .0000 for other students. Therefore, the sample students with continuous enrollment in college who had high enrollment in high school physical education were less likely to achieve as well in college English as other students. No significant relationship was found for the continuous enrollment group between level of enrollment in physical education and GPA in the other four academic subject areas of the composite GPA and no significant relationship was found between level of enrollment in physical education and GPA in college academic subjests for students who withdrew from college.

VI. RELATIONSHIPS BETWEEN ENROLLMENT LEVEL IN HIGH SCHOOL ACADEMIC SUBJECTS AND GPA IN COLLEGE ACADEMIC SUBJECTS

Parts C through G of Tables 35 and 36 summarize the results of the regression analyses performed to determine the relationships between level of enrollment in high school English, social studies, science, mathematics and foreign language and college GPA in these subjects. For students with continuous enrollment in college, the only high school academic subjects areas in which a significant relationship was found between level of enrollment and college academic GPA were mathematics and foreign language. As indicated in Part F-4 of Table 35, level of enrollment in high school mathematics was related to college science GPA at the .05 level of confidence and to college mathematics GPA at the .01 level of confidence. In both instances, the standard weights assigned to the variable in Full Regression Models representing students with high enrollment in high school mathematics was higher than those representing other students. Therefore, sample students with continuous enrollment in college and high enrollment in high school mathematics were more likely to have higher achievement in college science and mathematics than other students.

Level of enrollment in high school foreign language was significantly related at the .01 level of confidence to college GPA in English and in foreign language and to the composite college GPA for the five academic subject areas at the .05 level of confidence. This was the only instance in which level of enrollment in a high school academic subject area was significantly related to the composite GPA. The standard weights assigned to the variable in the Full Regression Models representing students with high foreign language enrollment were higher in each case than those assigned to the variable representing other students. Therefore, sample students with continuous college enrollment and high enrollment in high school foreign language were more likely to have higher college grade point averages in English, foreign language and the combined five academic subject areas than other students.

While the three instances cited above were the only ones for the continuous enrollment group in which level of enrollment in high school academic subjects was related to GPA in college academic subjects at the .05 level of confidence or better, there were two additional cases in which the relationship approached significance. The probability statistic for the relationship between level of enrollment in high school science and college GPA in foreign language was .0826 (See Table 46). This appeared to be an inverse relationship, however, since the standard weights assigned in the Full Regression Model were -.1130 for the variable representing students with high enrollment in high school science and .0000 for the variable representing other students. Thus, for the sample students with continuous college enrollment, there was a probability that in slightly over 92 times in 100, students with high enrollment in high school science had lower achievement in college foreign language than other students. The other case in which the relationship approached the .05 level of confidence was that between level of enrollment in high school mathematics and the composite GPA in college academic subjects. Here the probability statistic was .0805 (See Table 47), and the standard weights assigned in the Full Regression Model were .1130 for the high enrollment group and .0000 for other students. Thus, there was the probability that in 92 times out of 100, sample students with continuous college enrollment in high school mathematics would have a higher composite GPA in college academic subjects than other students.

The results of the regression analyses performed to determine the relationships between level of enrollment to high school academic subjects and college GPA in these subjects for students who withdrew from college are summarized in Parts C through G of Table 36. When I.Q. and sex of student variables were controlled, significant relationships were found between level of enrollment in high school mathematics and college GPA in both science and mathematics (See Table 36, Part F-3). The relationship was significant at the .01 level of confidence for college science GPA and at the .05 level for college mathematics GPA. The relationship between level of enrollment in high school mathematics and composite college GPA in the five academic subject areas approached significance at the .05 level with a p value of .0771 (See Table 53). In all three instances, the standard weights assigned in the Full Regression Models to the predictor variable representing students with a high level of enrollment in high school mathematics were larger than those assigned to the variable representing other students. Thus, we can assume that for the sample students who withdrew from college, there was a positive relationship between high enrollment in high school mathematics and college GPA in science, mathematics and the composite GPA in academic subjects at the probability levels indicated above. No significant relationships were found between level of enrollment in high school English, social studies, science or foreign language and college GPA in academic subjects for students who withdrew from college.

There were two additional instances in which relationships came fairly close to the .05 level of confidence. Enrollment level in high school social studies and composite college GPA produced a p value of .0904 (See Table 53), and enrollment level in high school foreign language produced a p value of .1036 (See Table 52). In both instances, the standard weights assigned in the Full Regression Models to the variable representing students with high enrollment levels were higher than those assigned to the variable representing other students.

In summary, when I.Q. and sex of student variables were controlled, positive relationships, significant at the .05 level of confidence or better, were found between high level of enrollment in high school mathematics and college grade point averages in science and mathematics. These relationships held true for both students with continuous enrollment in college and those who withdrew from college. Positive relationships which were close to being significant at the .05 level of confidence were also found between high enrollment in high school mathematics and composite GPA in college academic subjects for both student groups.

Positive relationships, significant at the .05 level of confidence or better, were found between high level of enrollment in high school foreign language and college GPA in both English and foreign language and the composite GPA in college academic subjects for students with continuous enrollment in college. The relationship between high level of enrollment in high school foreign language and college GPA in foreign language for students who withdrew in college was not significant at the .05 level, but was fairly close, with a p value of .10.

No relationships which were significant at the .05 level of confidence or better were found between enrollment level in high school English, social studies, or science and college grade point averages in these or other academic subjects.

VII. RELATIONSHIPS BETWEEN HIGH SCHOOL PROGRAM OF STUDIES AND COLLEGE ADMISSION REQUIREMENTS

The extent to which colleges require or recommend specific preparation in high school academic subjects plays an important role in determining the extent to which college preparatory students are free to include the arts and other so-called non-academic subjects in their high school program of studies. Research Question Seven is related to this aspect of the problem and was stated as follows:

> Is there evidence to indicate that high school students could enroll in more arts subjects and still earn the number of specific subject units required by most colleges with selective admission policies?

As was indicated in Chapter V, the entrance requirements of a sample group of 200 colleges were studied as a basis for answering Research Question Seven. The distribution of these colleges by total number of academic subject units required or recommended for admission is given in Table 37. Percentages are given for the total sample and for colleges in each of four admission categories: most competitive, highly competitive, very competitive and

TABLE 37

NUMBER AND PER CENT OF SAMPLE COLLEGES BY TOTAL NUMBER OF ACADEMIC SUBJECT UNITS REQUIRED OR RECOMMENDED FOR ADMISSION

Number of Academic Units	Total Sample. N = 200		Admission Category*							
			A N = 24		B N = 24		C N = 55		D N = 97	
	No.	%	No.	%	No.	%	No.	%	No.	%
No Specific Number	14	7.0	2	8.3	1	4.2	3	5.5	8	8.3
Less than 10 units	11	5.5	1	4.2	0	0.0	3	5.5	7	7.2
10 units	12	6.0	0	0.0	0	0.0	2	3.6	10	10.3
11 units	11	5.5	0	0.0	0	0.0	2	3.6	9	9.3
12 units	29	14.5	0	0.0	2	8.3	6	10.9	21	21.6
13 units	18	9.0	2	8.3	0	0.0	8	14.5	8	8.3
14 units	22	11.0	3	12.5	4	16.6	5	9.1	10	10.3
15 units	21	10.5	1	4.2	3	12.5	6	10.9	11	11.3
16 units	50	25.0	11	45.8	12	50.0	15	27.3	12	12.4
17 units	7	3.5	3	12.5	1	4.2	3	5.5	0	0.0
More than 17 units	5	2.5	1	4.2	1	4.2	2	3.6	1	1.0

* Admission Categories: A - Most Competitive
B - Highly Competitive
C - Very Competitive
D - Competitive

competitive. Fourteen, or 7.0 per cent of the colleges in the sample, did not require or recommend that applicants present a specified number of units in high school academic subjects. It cannot be assumed, however, that these colleges did not expect candidates to be well grounded in the high school academic subjects traditionally associated with preparation for college.

Twenty-three, or 11.5 per cent of the sample colleges required or recommended ten or less units in high school academic subjects. Only one of these colleges was in the top two competitive admission categories. At the opposite end of the scale, only twelve colleges, representing 6.0 per cent of the total sample, required or recommended that applicants present more than sixteen high school units in academic subjects. Six of these colleges were in the top two competitive categories and six were in the lower two categories.

Almost half (45.8 per cent) of the most competitive colleges, and exactly half of the highly competitive colleges required or recommended sixteen academic units for admission, while 27.3 per cent of very competitive colleges and only 12.4 per cent of the competitive colleges fell into the 16 unit category. One-fourth of the sample of 200 colleges required or recommended sixteen high school units in academic subjects. Slightly over 30 per cent of the sample colleges required or recommended thirteen to fifteen academic units. There were no great differences at this level between the four admission categories. Another 20 per cent of the sample colleges required or recommended either eleven or twelve academic units for admission, and all but two of these colleges were in the two lower competitive admission categories. Only 6.0 per cent of the colleges required or recommended ten academic units and all of these colleges were in the two lower categories.

As indicated in Chapter V, the admission categories into which the sample colleges were grouped were those utilized in the "College Admission Selector" section of the 1968-69 edition of Barron's Profiles of American Colleges. These categories were based upon such criteria as median college entrance examination scores, rank in high school graduation class and high school grade point averages of recent entering classes, rather than upon the number of academic units required or recommended for admission. The data in Table 37 does indicate, however, that colleges in the most competitive and highly competitive admission categories generally required or recommended more units in high school academic subjects than did those colleges in the very competitive categories. This is indicated more directly by the data in Table 38.

Table 38 shows the cumulative percentages of colleges in the sample by total number of units in high school academic subjects required or recommended for admission.

TABLE 38

CUMULATIVE PERCENTAGES OF SAMPLE COLLEGES BY TOTAL NUMBER OF ACADEMIC SUBJECT UNITS REQUIRED OR RECOMMENDED FOR ADMISSION

Number of Academic Units	PER CENT OF COLLEGES				
	Total Sample N = 200	Admission Category*			
		A N=24	B N=24	C N=55	D N=97
10 or less	11.5	4.2	0.0	9.1	17.5
12 or less	31.5	4.2	8.3	23.6	48.4
14 or less	51.5	25.0	24.9	47.2	67.0
16 or less	87.0	75.0	87.4	85.4	90.7
None specified	7.0	8.3	4.2	5.5	8.3
More than 16	6.0	16.7	8.4	9.1	1.0

* Admission Categories:
A - Most Competitive
B - Highly Competitive
C - Very Competitive
D - Competitive

Sixteen units in academic subjects met or exceeded the total unit requirements for 87.0 per cent of the sample colleges. These included 75.0 per cent of the colleges in the most competitive admission category, over 85 per cent of the colleges in the highly competitive and very competitive categories, and over 90 per cent of the colleges in the competitive admission category. These percentages probably run even higher, since 7.0 per cent of the colleges in the sample did not make specific requirements or recommendations concerning the number of high school academic units to be presented for admission.

A total of fourteen academic units met or exceeded the requirements of slightly over one-half of the sample colleges, including one-fourth of the colleges in the most competitive and highly competitive admission categories, almost half of the colleges in the very competitive category, and two-thirds of the colleges in the competitive category. Twelve units in high school academic subjects met or exceeded the requirements of almost one-third of the colleges in the sample. Very few of these colleges were in the two higher categories of competitive admission, but they included almost one-half of the colleges in the competitive category.

A student earning only ten units in high school academic subjects would substantially reduce his opportunity for admission to the sample colleges. Only 11.5 per cent of the colleges required or recommended as few as ten academic units, and almost all of these colleges were in the two lower admission categories.

Most of the sample colleges permitted some flexibility in the choice of specific academic subjects needed to meet the required or recommended unit totals. This can be readily seen by comparing the data in Tables 38 and 39. Table 39 gives cumulative percentages of the sample colleges by number of specified academic subject units required or recommended for admission. While only 11.5 per cent of the sample colleges required or recommended as few as ten high school academic units (Table 38), a much larger proportion, 33.0 per cent of the colleges, made specific subject requirements for no more than ten of the total units required or recommended for admission (Table 39). It was noted earlier that, in general, the more selective colleges tended to require or recommend a larger total number of high school academic units for admission. The data in Table 39 indicate this same pattern in terms of number of units that must be earned in specified academic subjects. For example, one-fifth of the most competitive admission category specified as few as twelve of the total required or recommended units. This increased to half of the colleges in the highly competitive and very competitive categories and included three-fourths of the colleges in the competitive category. The degree to which colleges specify not only the number, but the type of academic subject units desired of applicants for

TABLE 39

CUMULATIVE PERCENTAGES OF SAMPLE COLLEGES BY TOTAL NUMBER OF SPECIFIED ACADEMIC SUBJECT UNITS REQUIRED OR RECOMMENDED FOR ADMISSION

Number of Specified Units	PER CENT OF COLLEGES				
	Total Sample N=200	ADMISSION CATEGORY*			
		A N=24	B N=24	C N=55	D N=97
10 or less	33.0	16.7	20.9	32.8	39.9
12 or less	59.0	20.9	50.0	51.0	75.0
14 or less	80.5	66.7	70.8	76.5	88.4
16 or less	96.5	91.7	91.7	94.6	100.0

* Admission Categories: A - Most Competitive
B - Highly Competitive
C - Very Competitive
D - Competitive

admission is an important factor in determining the extent to which college preparatory students are free to elect non-academic subjects such as the arts in high school.

The data in Tables 38 and 39 indicate that there is a great deal of variation among colleges in both the total number of high school academic units required or recommended for admission and the number of units within the total which must be earned in specific subjects. Furthermore, with the possible exception of a relatively small number of colleges which seek a highly selective student body, college entrance requirements do not in themselves place undue restrictions upon the college preparatory student who wishes to include a sizable number of the so-called non-academic subjects in the high school program of studies. This observation is further illuminated by the data in Tables 40 and 41.

Table 40 gives the percentages of those colleges in that portion of the sample which required or recommended specific subject preparation by the number of units either required or recommended in each academic subject field. The most commonly accepted college requirement was in the area of English in which 86.4 per cent of the sample required or recommended four units of high school credit. In most instances, this is an actual requirement rather than a recommendation. None of the colleges required less than three units of English. Only 2.2 per cent of the colleges required or recommended four units in social studies and

TABLE 40

PER CENT OF COLLEGES IN PORTION OF SAMPLE REQUIRING SPECIFIC PREPARATION BY NUMBER OF UNITS PER ACADEMIC SUBJECT REQUIRED OR RECOMMENDED FOR ADMISSION

Subject	PER CENT OF SAMPLE PORTION BY NUMBER OF UNITS N=184				
	None	1	2	3	4
English				13.6	86.4
Social Studies	23.9	21.2	40.2	12.5	2.2
Science	16.8	26.1	38.6	16.3	2.2
Mathematics	7.6	1.6	32.1	38.6	20.1
Foreign Language	16.8		47.8	15.3	20.1*

* Includes three colleges, representing 1.6 per cent of the sample portion, which recommended five high school units in foreign language.

science. Four units in mathematics were required or recommended by 20.1 per cent of the colleges, and an equal portion required at least four units offoreign language. At the opposite end of the scale, 23.9 per cent of the colleges neither required nor recommended social studies units. This was also true for 16.8 per cent of the sample portion in the fields of science and foreign languages.

As can be seen from the precentage distribution in Table 40, the majority of the colleges required or recommended four units in English, one or two units each in social studies and science, and two or three units each in mathematics and foreign language. None of the colleges recommended or required one unit in foreign language. Colleges which have a foreign language entrance requirement expect applicants to present at least two units of credit in the language.

Table 41 shows cumulative precentages of the 184 colleges in the sample which required specific preparation by number of units per academic subject required or recommended for admission. None of the colleges required or recommended more than four units in English. Two units in social studies met or exceeded the requirements of at least 80 per cent of the colleges in each admission category, and three units met or exceeded the requirements of from 95 to 100 per cent of the colleges in each admission category. Two units in science met or exceeded the requirements of

TABLE 41

CUMULATIVE PERCENTAGES OF COLLEGES IN PORTION OF SAMPLE REQUIRING SPECIFIC PREPARATION BY NUMBER OF UNITS PER ACADEMIC SUBJECT REQUIRED OR RECOMMENDED FOR ADMISSION

Subject and Units	Total Sample Portion N=184	Admission Category* A N=22	B N=21	C N=52	D N=89
English					
4 units or less	100.00	100.00	100.00	100.00	100.00
Social Studies					
2 units or less	85.3	81.9	95.2	78.9	87.7
3 units or less	97.8	95.5	100.0	96.2	98.9
Science					
2 units or less	81.5	81.8	76.2	78.8	84.2
3 units or less	97.8	100.0	95.2	100.0	96.6
Mathematics					
2 units or less	41.3	4.5	9.5	34.6	61.7
3 units or less	79.9	50.0	57.1	78.8	93.2
Foreign Language					
2 units or less	64.6	36.4	23.8	55.8	86.5
3 units or less	79.9	50.0	52.4	75.0	96.6

*Admission Categories: A - Most Competitive
B - Highly Competitive
C - Very Competitive
D - Competitive

81.5 per cent of the 184 colleges, and there was little variation from this percentage within the four admission categories. Three units in science met or exceeded the requirements of between 95 and 100 per cent of the colleges in each admission category.

There was much more variation among the admission categories in the number of units required or recommended in mathematics and foreign language. Slightly over 60 per cent of the colleges in the competitive admission category required or recommended two or less units in mathematics, and this diminished to 34.6 per cent of the colleges in the very competitive category. Only 9.5 per cent of the colleges in the highly competitive category and 4.5 per cent of the colleges in the most competitive category required or recommended as few as two units in mathematics. Three units in mathematics met or exceeded the entrance requirements of almost 80 per cent of the 184 colleges, including 93.2 per cent of the colleges in the competitive and 78.8 per cent of the colleges in the very competitive categories. Just over 57 per cent of the colleges in the highly competitive admission category and exactly half of the colleges in the most competitive category required or recommended three units or less in high school mathematics.

Two units in a foreign language met or exceeded the requirements of 64.6 per cent of the sample colleges which required specific subject preparation in high school. This included 86.5 per cent of the colleges in the competitive admission category. The percentage of colleges requiring two or less foreign language units was 23.8 per cent in the highly competitive admission category and 36.4 per cent in the most competitive category. It is interesting to note that the same percentage of the 184 colleges (79.9 per cent) required or recommended three or less credits in mathematics. The percentage distribution by admission categories are also similar at this level. Three foreign language units met or exceeded the entrance requirements of almost all (96.6 per cent) of the colleges in the competitive admission category and three-fourths of the colleges in very competitive category. Slightly over half of the colleges in the highly competitive category and exactly half of the colleges in the most competitive category required or recommended three or less units in foreign language for admission.

The statements which follow summarize the findings related to the number and distribution of academic subject units required or recommended for admission by the 200 colleges included in the survey.

1. There was a great deal of variation among the colleges in both the number and type of academic subject units required or recommended for admission. In general, colleges in the higher competitive admission categories tended to require or recommend more academic subject units and to be more specific in the number of units desired in each subject area.

2. Fourteen, or 7.0 per cent, of the colleges neither required nor recommended that applicants for admission present a specific number or pattern of academic subject units. Two of these colleges were among the twenty-four classified as having the most rigorous admission standards in the country.

3. Slightly over half of the colleges required or recommended fourteen or less academic subject units for admission. These included three-fourths of the colleges in the competitive admission category.

4. Sixteen units in high school academic subjects met or exceeded the admission requirements of 87.0 per cent of the sample colleges, including three-fourths of those in the highest and nine-tenths of those in the lowest of the four categories of competitive admission included in the survey.

5. Only twelve, or 6.0 per cent, of the sample colleges required or recommended more than sixteen academic subject units for admission.

6. Most of the colleges allowed some degree of choice within the total number of academic subjects units required or recommended for admission. For example, while only 11.5 per cent of the colleges required as few as ten or less academic units for admission, 33.0 per cent of the colleges required or recommended ten or less units in specific subject areas.

7. While 86.4 per cent of the colleges required or recommended four units in English for admission, the percentage of colleges requiring or recommending as many as four units in other academic subjects was much smaller. There were 2.2 per cent each for social studies and science and 20.1 per cent each for mathematics and foreign language.

8. Most of the colleges which required or recommended more than three high school units in mathematics and foreign language were in the most competitive and highly competitive admission categories.

The findings summarized above can be taken as a liberal estimate of the number of high school academic subject units required for admission to most American colleges. The sample of 200 colleges was weighted in favor of colleges in the top two categories of competitive admission, and these colleges tended to require more academic subject units than others. No colleges were included in the sample which represented the 480 accredited four-year institutions which were categorized as being either less competitive or non-competitive in terms of admission. Furthermore, the unit totals used in this study included subject units which colleges recommended as well as those actually required.

When the number and patterns of high school academic subject units earned by students in the High School Sample is compared with the findings of the college admission requirement phase of this study, it would appear that the students could have earned fewer academic units and still have met the requirements of most colleges with selective admission policies. This would have allowed them more opportunity to enroll in the so-called non-academic subjects, including the arts, during their four years in senior high school.

The college preparatory students included in this study earned a mean of 18.73 units in high school academic subjects. Almost all of the students earned more than seventeen units, and many earned more than twenty. Only 2.5 per cent of the sample colleges required or recommended that applicants present more than seventeen units in academic subjects. Almost without exception, all students in the High School Sample earned at least four units in social studies, and 28.0 per cent of the students in the College Sample earned more than four units. Yet, 85.3 per cent of the colleges included in the admission requirement survey required or recommended two or less units in social studies, and 97.8 per cent required or recommended three or less units. Almost two-thirds (64.8 per cent) of the students in the College Sample earned more than three units in high school science, while three science units met or exceeded the entrance requirements of 97.8 per cent of the colleges surveyed. An almost identical proportion (64.3 per cent) of students in the College Sample earned more than three high school units in mathematics. Three units in mathematics met or exceeded the entrance requirements of 79.9 per cent of the sample colleges. This same proportion of colleges required or recommended three or less units in foreign language for admission. Yet, almost half of the students in the College Sample (48.6 per cent) earned more than three foreign language units.

So far as number and distribution of high school academic subject units is concerned, the program of studies of most of the students included in this study would appear to be designed to meet the admission requirements of highly selective colleges. However, as the data which follow indicate, slightly less than 5.0 per cent of the students in the College Sample entered colleges in the top two competitive admission categories, and 44.8 per cent of the students entered colleges which were less selective in admission than any of the colleges included in the survey.

Per Cent of Students in College Sample by
Admission Category of College Entered

Category	Per Cent
Most Competitive	1.1
Highly Competitive	3.8
Very Competitive	28.0
Competitive	22.3
Less Competitive or Non-Competitive	44.8

The findings of this study related to college entrance requirements indicate that Research Question Seven could be answered in the affirmative. So far as the high school students included in this study were concerned, there was evidence that they could have enrolled in more arts subjects and still have earned the number of specific subject units required by most colleges with selective admission policies.

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CHAPTER VII

SUMMARY, DISCUSSION AND RECOMMENDATIONS

I. SUMMARY

This study provided a descriptive analysis of certain factors associated with the program of studies and academic achievement of a sample group of 944 college preparatory students who graduated from three high schools in Harford County, Maryland, in June of 1963, 1965, and 1967. Special emphasis was placed upon the extent to which these students enrolled in high school arts subjects and upon a comparison of students who had a high level of enrollment in arts subjects with other students on the basis of achievement in high school and college academic subjects and other selected variables. For the purpose of this study, students who earned three or more enrollment units in music, drama or art in grades ten through twelve were classified as high arts students. An enrollment unit was assigned to any subject which met for five regular class periods per week for thirty-six weeks. Approximately 20 per cent of the sample students were classified as high arts students.

All students in the sample earned the Maryland Academic Diploma which required the successful completion of at least sixteen units in academic subjects. Most of the students earned at least eighteen units in high school academic subjects.

The schools from which the sample population was drawn were described as having characteristics in common with a large number of American high schools in terms of size, degree of comprehensiveness of program of studies, proportion of graduates continuing their education, and socio-economic background of students.

Findings related to extend of enrollment in high school arts subjects indicated that while three-fourths of the sample students enrolled in at least one arts subject in grades nine through twelve, only 58.5 per cent of the sample earned as much as one full enrollment unit in senior high school arts subjects. Over forty per cent of the sample elected no arts subjects in ten through twelve. Less than 10 per cent of the sample enrolled in more than one arts subject at any grade level, only 3.6 per cent earned as many as four enrollment units in arts subjects in grades ten through twelve, and none earned more. The proportion of girls who enrolled in arts was higher at each grade level than was the proportion of boys. A higher proportion of boys had no enrollment in arts subjects during their four years in high school, and the proportion of girls with high enrollment in high school arts subjects was greater than that for boys.

There was evidence of a trend toward decreasing enrollment in arts subjects during the period under study (1959-1967). The trend was especially evident at the ninth grade level where losses in proportion of both female and male students enrolled in arts subjects were significant at well beyond the .01 level of confidence. There was a significant increase in the proportion of students who enrolled in no arts subjects during their four years of high school. There was also a significant increase in the proportion of male students who elected no arts subjects in grades ten through twelve. There was an increase during the period of 11 per cent in the proportion of female students who earned three or more enrollment units in arts in grades ten through twelve. This increase was significant at the .05 level of confidence but was partially off-set by a 3.7 per cent decrease in the proportion of male students with high arts enrollment in grades ten through twelve. Losses in arts enrollment by college preparatory students during the period under study were attributed to an increased emphasis upon physical education and a change in the procedure for scheduling electives in ninth grade, rather than to an increased emphasis upon academic subjects.

A comparison of high arts students--those who earned at least three enrollment units in arts subjects in grades ten through twelve--with other students revealed few significant differences. There was a higher proportion of female students in the high arts group, and this group earned slightly less credits in academic subjects than did other students. Mean I.Q. and grade point average in high school academic subjects were almost identical for the two groups, as was the proportion of each which entered or withdrew from college. There were no significant differences between high arts students and other students in terms of major and minor fields of study in college. A significantly larger proportion of the high arts students enrolled in more than six semester hours of arts subjects during their first two years of college. An unexpected finding of the study was the fact there was a significant increase during the period in the proportion of students who enrolled in at least one arts course during their first two years of college.

When I.Q. and sex variables are controlled, enrollment level in high school arts subjects had no significant effect upon either high school or college grade point average in academic subjects. Thus, it would appear that the sample students who elected additional arts subjects in high school were neither aided nor penalized in terms of academic achievement by the fact that they devoted a larger proportion of their high school program to the arts than did other students. The same statement could be made for the sample group regarding level of enrollment in three of the five academic subject areas. Level of enrollment in high school English, social studies and science had no significant effect upon college GPA in any of the five academic subject areas or upon the composite GPA in these subjects. This was true for both students with continuous enrollment in college and for those who withdrew from college.

High enrollment in foreign language had a significant positive effect upon college GPA's in English and foreign language and upon the composite GPA in academic subjects for students with continuous college enrollment, but had no significant effect upon college GPA's in academic subjects for students who withdrew from college. High enrollment in high school mathematics had a significant possitive effect upon college GPA's in mathematics and science for both continuous enrollment and withdrawal students, but had no significant effect upon college GPA's in the other three academic areas or upon the composite GPA in academic subjects areas.

Physical education was the only high school non-academic subject area other than the arts in which there was a sufficient number of sample students with high enrollment to permit an analysis of effect of level of enrollment upon grade point averages in college academic subjects. A significant inverse relationship was found between high enrollment in physical education and college English GPA for students with continuous enrollment in college. However, the relatively small number of sample students (twenty) in this category makes this finding somewhat inconclusive. No other significant relationships were found between enrollment level in high school physical education and grade point averages in college academic subjects.

The published entrance requirements of a sample group of 200 colleges with selective admission policies were surveyed and comparisons made between the number and distribution of academic subject units required or recommended for admission and those earned by the student sample selected for this study. All students in the sample earned at least 17 high school units in college preparatory subjects and, with very few exceptions, earned four units each in English and social studies and three units each in science, mathematics and foreign language. Mean number of high school academic subjects earned by the sample students was 18.85 units.

This preparation exceeded the number of specified subject units required or recommended for admission to all but the most selective colleges in the country. Yet, less than five per cent of the sample students entered this group of colleges. The conclusion was drawn that the college preparatory program of studies in the schools from which the sample students were drawn could be more flexible in terms of the number and distribution of required academic subjects and still meet or exceed the number of specified subject units required or recommended for entrance to most of the colleges for which the students were preparing. This increased flexibility would provide more opportunity for college preparatory students to elect subjects such as the arts which are not directly related to the college goals of most students.

II. DISCUSSION

Extent of Enrollment in High School Arts

As a group, the college preparatory student included in this study had only limited curricular experiences in the arts during their four years of senior high school. A quarter of the sample enrolled in no arts subjects in grades nine through twelve, and another 16.8 per cent of the students earned less than one enrollment unit in high school arts. Over forty per cent of the sample elected no arts subjects during their last three years of high school. There were very few instances in which students enrolled in more than one arts subject per year. Most of the relatively small proportion of the sample (19.5 per cent) who were classified as high arts students earned three units in the arts during grades ten through twelve. This represented only 16.6 per cent of their program of studies in these grades. If the limited involvement in the high school arts program which characterized the student sample drawn for this study is typical of college preparatory students throughout the country, there is ample cause for concern regarding the future development of the arts in our society. Many future artistic leaders and most of the educational, business, professional and political leaders who will in large measure determine the extent to which the arts receive encouragement and support will come from the ranks of the present generation of college preparatory students. It is reasonble to assume that the formative years spent in senior high school play a large role in shaping both the skills and values of our future artists and the attitudes toward the arts which will be held by those who will determine the role of the arts in tomorrow's society.

While the trend toward decreasing enrollment in arts subjects by the students included in this study was not directly related to increasing enrollment in academic subjects, it was related to the rigid structure of the college preparatory program of studies. This program was well established in the study schools prior to the period covered by this research. College preparatory students were required to schedule academic subjects for five of the six periods in the school day in grades nine and ten and were encouraged to do likewise in grades eleven and twelve. Enrollment losses were noted in the arts when the study schools made the program even more rigid by offering one elective in ninth grade which met daily, rather than offering two electives which met on alternate days. Under this arrangement most students were scheduled for physical education. While enrollment in at least one year of physical education during senior high school was not an absolute requirement in the study schools, there was a strong recommendation to this effect by the

Maryland State Department of Education. It will also be recalled that there was heavy national emphasis upon physical education during the 1960's, largely through the efforts of the President's Council on Youth Fitness.

Any limitation of opportunity for enrollment in elective subjects at the ninth grade level is particularly damaging to the curricular offerings in the performing arts such as band, orchestra, and chorus. The educational value of these offerings is best achieved when there is an unbroken sequence of skill development throughout the junior and senior high school years. Many students, particularly those in instrumental music, who drop out of the program at the ninth grade level fail to re-enter in a higher grade because they feel they are at a disadvantage when they must perform in the same group with students who have had no break in the continuity of their development of musical skills. Ideally, students with particular interest in the performing arts should be able to maintain an unbroken continuity of skill development during their four years of high school and still be able to elect offerings in such areas as physical education and the practical arts which serve other dimensions of personal development. It is also reasonable to suppose that a sizable number of students should be interested in taking more than one arts subject during a given year in high school.

Male Participation in the Arts Program

The only significant difference found in this research between students in the sample with high arts enrollment and other students was the greater proportion of female students in the high arts group. This finding is consistent with those of other surveys of enrollment in high school arts subjects. Generally speaking, more girls than boys tend to be attracted to curricular offerings in the arts. This fact has long disturbed arts educators. It is doubtful that the arts will achieve greater status in the high school curriculum until such time as they are able to attract a larger proportion of male participants.

The findings also indicated that the proportion of male students enrolled in the arts declined to a greater extent during the period under study than was the case with girls. The proportionate enrollment loss was greater among boys than girls in the ninth grade, and losses in male enrollment were registered at each succeeding grade level. On the other hand, there was a gain in the proportion of female students who enrolled in arts subjects in grades ten through twelve. There was a significant increase during the period in the proportion of boys who enrolled in no arts subjects in senior high school and a slight loss in the proportion of boys who were classified as high arts students. This was in contrast to a significant increase in the proportion of high arts students among female students. Thus, the gap between male and female student participation in the high school arts program became greater during the period covered by this study.

The Need for a Balanced Curriculum

The program of studies completed by the college preparatory students selected for this research did not permit the degree of flexibility necessary for exploration of a variety of non-academic subject fields or for concentrated study in a single non-academic field. All of the students included in this research devoted at least 70 per cent of their high school program of studies to academic subjects, and most of the students devoted at least 80 per cent of their program to these subjects. The utilization of a seven-period school day or one of the various approaches to flexible scheduling would provide more opportunity for the election of non-academic subjects while maintaining a heavy emphasis upon academic subjects. This solution, though obvious, is not so easily attained since it requires additional teaching space and teaching personnel, both of which are quite expensive. The Harford County schools, as is the case with most rapidly growing school systems, are experiencing economic difficulties in this age of skyrocketing educational costs.

Despite the continuing lip service paid to the virtues of a "balanced education," few curriculum leaders have ventured a definition of what constitutes this balance in a college preparatory program of studies. We live in an age which places great value upon cognitive learning, yet increasing emphasis is also being placed upon the values of affective learning, the humanizing effect of the arts in a society which is becoming highly mechanistic and impersonal, the necessity for devoting more attention to the physical development of the adolescent, and the desirability of giving college preparatory students the practical skills which will enable them to better fulfill their roles as future homemakers and heads of households. In addition, this generation of college preparatory students can look forward to greater amounts of leisure time; yet the high school curriculum provides few experiences which will prepare them for its wise use.

It would seem reasonable for the college preparatory student to expect a high school education which will adequately prepare him for the continuation of his academic studies and still allow him ample opportunity for personal development in areas which are not directly related to academic achievement. This type of curriculum is possible only in high schools where those in authority feel the necessity for maintaining a balance between the so-called "academic" and "non-academic" subject areas, are willing to define this balance in concrete terms, and will exert the necessary effort in the areas of curriculum planning, scheduling, and finance to obtain it.

Relationships Between Level of Enrollment in High School Subjects and College Achievement

At face falue, the findings of this study provide little comfort for the curriculum reformer who would provide additional time within the college preparatory program of studies for the so-called "non-academic", such as the arts subjects, by de-emphasizing academic subjects. Success in college is a major goal of the college preparatory student, and the results of this study did provide some evidence of the value of a rigorous course of study in at least two academic areas: foreign language and mathematics. The findings did not, however, necessarily support the value of "taking as many units as possible" in each of the five high school academic subject areas. When other variables were controlled, high enrollment in English, social studies, and science had no significant effect upon college grade point average in academic subjects. Stated differently, students with high enrollment in these subjects apparently had no significant advantage over students with high enrollment in arts subjects or, with the possible exception of college English achievement, over students with high enrollment in physical education.

Furthermore, the findings were mixed regarding the effect of high enrollment in foreign language and mathematics upon GPA in college academic subjects. Enrollment level in foreign language had no significant effect upon college GPA in science, mathematics, or social science for students with continuous enrollment in college and did not significantly affect any of the college GPA's for students who withdrew from college. Enrollment level in mathematics had no significant effect upon the composite GPA or upon GPA's in college English, social studies, and foreign language for either student group. These relationships tend to support the commonly held view that many students do not have equal aptitude in the computational and verbal areas.

An additional finding related to enrollment in foreign language is of interest. While almost all of the students with continuous enrollment in college took at least one course in each of the other four academic subject areas, over half of these students took no college courses in foreign language. This was true for many of the students who earned more than three high school units in foreign language. It would appear that the college curricula of most of the students did not require foreign language study and that these students lacked either the time or desire to elect college courses in foreign language. The fact that a majority of the students in the continuous enrollment group had completed four rather than eight semesters of college is probably of little consequence so far as this finding is concerned. Students who have not studied a foreign language since their junior or senior year in high school seldom elect foreign language courses during their last two years of college.

The Arts as Preparation for College

One of the unanticipated findings of this research was the fact that there was increased enrollment during the period by the sample students in arts subjects during their first two years in college. When the college records of the 1965 high school graduates were compared with those of the 1963 graduates there was a significant increase in the proportion of students who enrolled in at least one arts course during their first four semesters of college. There was also an increase in the proportion of students with four semesters of continuous college enrollment who earned more than six semester hours in arts subjects.

An inspection of the college transcripts of the sample students and the catalogs of a number of the colleges attended by these students indicated that many college curricula require successful completion of at least one college course in the arts. A number of colleges include as much as six semester hours in the humanities. These courses usually place some emphasis upon the historical development of the fine arts and the manner in which literature, philosophy, politics and the arts expressed the major concerns of society during particular periods in the development of civilization. It appears that there is some evidence to indicate that colleges and universitites are beginning to place greater emphasis upon the role of the arts in general education. This being the case, it would seem appropriate for secondary schools to be cognizant of this development and to provide curricular offerings in the arts which will provide continuity of learning in this area at a level comparable to that presently provided in the traditional academic subjects.

Arts teachers in the schools which cooperated in this study indicate that they are encountering more students in recent years who are interested in majoring in an arts subject in college. Very few courses are presently being offered in these schools which provide adequate preparation for concentrated collegiate study in the arts. In addition to the potential college arts majors, there are usually a number of students in a sizable high school student body who, while not planning to prepare for a career in the arts, have a strong enough avocational interest in one or more of the arts to elect specialized arts offerings in high school and college.

Implications for the Guidance Program

The findings of this research emphasize the need for careful and individualized guidance of college preparatory students in the selection of courses for inclusion in their high school program of studies. A stereotyped "track" approach to college preparation does not provide sufficient flexibility to serve the varied individual goals, needs, and abilities of students.

The Academic Diploma program of studies completed by the students included in the study appeared to be designed to meet the entrance requirements of colleges which are seeking a highly selective student body. Yet, less than 5 per cent of the sample students attended such colleges. The entrance requirements of colleges vary greatly, and there are not many programs of study available to students after admission. Most of the students included in this study entered the local community college, a state college, or a state university. Many entered curricula within these institutions in which they took a number of pre-professional courses during their first two years of college. It is no longer true that all college students take pretty much the same courses--English, science, mathematics, foreign language and history--during their first two years of college.

The Academic Diploma program of studies completed by the sample students closely paralleled that recommended for academically talented students by Dr. James B. Conant in his influential report, "The American High School Today." Dr. Conant defined the academically talented as the upper 15 per cent of high school students on a national basis in terms of their performance on scholastic aptitude tests and their achievement in the lower grades. He recommended that these students take at least four years each of English, social studies, mathematics and foreign language and at least three years of science. Approximately 50 per cent of the students in the three study schools were enrolled in the Academic Diploma program of studies. Consequently, the proportion of students in these schools who enrolled in the type of program recommended by Dr. Conant for the academically talented student was considerably higher than 15 per cent. Yet, the findings of this study did not indicate that the three high schools had an exceptionally high proportion of academically talented students.

Since 1968, the Maryland State Board of Education has discontinued the practice of awarding four separate diplomas --Academic, Commercial, General, and Vocational--based upon the completion of four clearly defined and rather rigid courses of study. The single diploma concept carries with it the provision that individualized programs of study geared to the goals, needs, interests, and abilities of students will replace the former practice of placing all students in one or several predetermined curricular tracks. All Maryland high school graduates are required to complete at least eighteen units of high school work, twelve of which must be earned in specified general education areas. Presumably, a great deal of flexibility is possible in the selection of subjects included in the remainder of the program. Thus, it would appear that the possibility now exists for college preparatory students to elect more arts subjects in the three study schools than was the case during the period covered by this research. However, the guidelines issued by the Maryland State Department of Education for administering the single diploma program include the statement: "For students interested in continuing their education beyond high school, care should be taken to insure that at least seventeen units (physical education excepted) are of type commonly accepted for admission to post-high school education institutions." If this statement is interpreted as meaning that college preparatory students should earn at least sixteen units in academic subjects, little flexibility has been gained so far as the balance between academic and non-academic subjects is concerned. The findings of this study did not indicate that most colleges require sixteen academic subject units for admission. Guidance counselors should also be aware of the fact that many colleges will accept the inclusion of some units in the arts in the total presented for admission.

The findings of this study indicated that it is not necessary to counsel students to take as many units as possible in each academic subject area in order to succeed in college. Guidance officials would be ill-advised to counsel all students to take extra courses in the two areas, mathematics and foreign language, in which this study indicated that high levels of enrollment had a positive effect upon college achievement. It is reasonable to assume that many students who have good overall aptitude for college work have insufficient specific aptitude or interest to succeed in an advanced mathematics course or in the fourth year of foreign language study. For such students, enrollment in these additional courses would merely serve to lower their high school grade average. This could work to the student's disadvantage since grade average in high school academic subjects is considered by many admission officials to be the best single predictor of success in collegiate studies. Consequently, it is usually given heavy consideration in the college admission process.

III. RECOMMENDATIONS

The recommendations which follow are offered as a result of the findings of this research. While they apply directly only to the schools from which the student sample was drawn, they have possible application to high schools with similar student populations.

Recommendation for High School Arts Educators

It is recommended that high school arts educators:

1. Survey college preparatory students to determine the types of additional curricular offerings in the arts which would meet their needs, interests, and abilities.

2. Make a concentrated effort to encourage greater participation by college preparatory students in the high school arts program, particularly on the part of male students.

3. Investigate the possibilities for expanding the current arts curricula to include more offerings in the arts which are not dependent upon performance skills.

4. Investigate the possibilities for offering courses which will provide more intensive preparation for students who plan to continue the study of one or more of the arts in college.

5. Investigate the possibilities for offering one or more integrated arts or arts and humanities courses.

6. Become aware of college entrance requirements and data provided by this research and similar studies as a basis for encouraging college preparatory students to continue their studies in the arts during their senior high school years.

Recommendations for High School Administrators

It is recommended that administrators of the study schools make a sincere effort to create a more flexible schedule to permit broader participation in the arts program by college preparatory students. Greater flexibility is particularly needed in grades nine and ten. A seven or eight-period day would offer much more opportunity for enrollment in non-academic electives than is possible under the present six period day. Modular scheduling would appear to offer the best possibility for maximum flexibility. If these approaches are not economically feasible because of the increased teaching space and staff required for implementation, consideration should be given to offering most subjects for four rather than five periods per week. Four class periods per week of sixty minutes each would satisfy the time requirements established by the Maryland State Department of Education for one full unit of credit for all academic subjects except biology, chemistry and physics and for three-quarters of a unit for non-academic subjects. Thus, by adding thirty minutes to the school day, students could enroll in five subjects which meet four times per week and in two subjects which meet five times per week within the framework of the six-period day.

It is further recommended that high school administrators give serious consideration to supporting the addition of at least one unit of credit in the arts area to the general education requirements for graduation from high school. While it is generally accepted that the arts are an important part of our cultural heritage, fill an important role in contemporary society, and have much to offer in terms of personal enrichment, an increasingly high proportion of students have no curricular experiences in the arts in senior high school. The arts will most likely remain on the fringes of the curriculum until such time as they are accepted as a bona fide part of the general education of all students. In Maryland, this requirement could be effected at either the state or local board of education level. In either instance, the enactment of an arts requirement for high school graduation is unlikely without the strong support of local school administrators.

Recommendations for Further Study

It is recommended that the portion of this study related to patterns of course selection by college preparatory students be duplicated for the graduating classes of 1972. This class represents the first group of students who will have been enrolled in the study schools for four years under the single diploma program instituted in 1968. The findings of the study would indicate whether the trend toward decreased enrollment in high school arts subjects continued past 1967 and if the increased flexibility provided by the single diploma approach resulted in greater participation by college preparatory students in the high school arts program and in a closer balance between academic and non-academic subjects.

It is also recommended that research designed along lines similar to those developed for this study be conducted in other school systems. Such research could provide data which would be helpful to curriculum planners and guidance officials in the participating schools and would provide a basis for evaluating the extent to which the findings of this study could be generalized to other student populations.

Finally, it is recommended that arts educators conduct surveys or utilize other research techniques which will provide a basis for understanding the relationships between high school curricular offerings in the arts and collegiate offerings and requirements in the arts and humanities. The findings of this study provided some evidence of a trend toward the inclusion of at least one course in the arts or in a humanities course including arts content in the general education requirements for graduation from college. In addition, many pre-professional curricula in colleges and universities require successful completion of arts courses. For example, curricula in elementary teacher education, a field which is attracting greater numbers of students in recent years, usually include at least one course each in music and art. Also, as high schools get larger and as career opportunities in the arts become more abundant, greater numbers of high school students are preparing to major in an arts subject in college. Yet, the scope and depth of high school preparation for these students is seldom equal to that offered students who plan to major in one of the traditional academic subject areas.

High school arts educators need to conduct the research needed for greater awareness of both the types of college arts courses in which their students are most likely to enroll and the content of these courses. The demands of such research are less formidable if first priority is given to a study of the arts requirements and offerings of the colleges which graduates of a particular high school are most likely to attend. For example, 62.7 per cent of the students included in the College Sample drawn for this study entered

Harford Junior College, Towson State College, or the University of Maryland. Furthermore, a large proportion of the students who entered Harford Junior College transferred to one of the latter two institutions for their last two years of college. A cooperative study conducted by representative arts educators from the Harford County high schools and these three higher education institutions could be most beneficial in providing the type of educational continuity in the arts which is taken for granted in other areas of the curriculum. Included in such a study should be a consideration of the possibilities for offering advanced placement in college arts courses for students who have better than average high school preparation in these subjects. This co-operative approach to research by representatives of a school system and a relatively small number of colleges and universities would probably be applicable to many areas of the country, since an increasing proportion of high school graduates are entering public institutions of higher learning.

The findings of this study provided data which should prove helpful to arts educators, administrators and guidance officials of the cooperating schools in their efforts to provide an effective program of secondary school education for the college preparatory student. There is need for a large body of research at local, state, and national levels which provides data related to the role of the arts in both the general and pre-professional education of the college preparatory student. Above all, the findings of such research must be disseminated throughout the profession and must be used by arts educators in an effective manner to influence change in those attitudes and administrative procedures which are detrimental to the high school arts program. Research findings can also provide information which will enable arts educators to reshape their curricular offerings in a fashion which will more nearly conform to the needs, interests, and goals of the college preparatory student. It is doubtful if the status of the arts in the college preparatory program of studies will improve greatly until arts educators themselves have both the data and the desire to make a more effective impact upon the decision making process of students, parents, high school administrators, guidance officials, and curriculum planners.

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APPENDIX A

DATA COLLECTION INSTRUMENTS

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Request for Student Release of Transcript 297

College Data Form 299

College Data Summary Form (Abridged) 301

College Data Code Sheet 302

DATA COLLECTION FORM - (Abridged) Page 1
High School Sample

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Name	I.D. No	SC	Cl	SX	QR	Gre	Total Units

(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Otis IQ	SAT		ACT				
	VB	MAT	E	M	SS	NS	COMP

KEY AND CODES

AN= Actual numbers sppearing in raw data transferred to IBM cards

Column	Description	Code
1	Name of Student-not transferred to IBM cards	
2	Identification Number-assigned in sequential order	AN
3	School Attended	1-Aberdeen 2-Bel Air 3-Edgewood
4	Graduating Class	3-1963 5-1965 7-1967

DATA COLLECTION FORM
High School Sample - Page 1

Key and Codes (Continued)

Column	Description	Code
5	Sex	1-Male 2-Female
6	Quintile Rank in Graduating Class	AN-1-5
7	Grade Entered Study School	1-Ninth 2-Tenth
8	Total Units Earned Toward Graduation	AN
9	Otis I.Q.	AN
10	SAT Verbal Score	AN
11	SAT Math Score	AN
12	ACT English Score	AN
13	ACT Math Score	AN
14	ACT Social Science Score	AN
15	ACT Natural Science Score	AN
16	ACT Composite Score	AN

DATA COLLECTION FORM -(Abridged) Pages 2-5
High School Sample

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Gr.	Credit Units and Grade Points											
	Eng.		Soc. St.		Science		Math		For. Lang.		Other Acad.	
	U	GP	U	GP	U	GP	U	GP	U	GP	U	GP

(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
ENROLLMENT UNITS												
Non-Arts Subjects							Arts Subjects					
Typ	Dft	P.E.	I.A.	B.E.	B.E.	Oth	G.M.	C.M.	IM	OM	Art	SP-DR

KEY AND CODES

AN= Actual number appearing in raw data transferred to IBM card

Column	Description	Code
1	Grade	1-Ninth 2-Tenth 3-Eleventh 4-Twelfth
2,4,6,8,10,12	Units earned in academic subjects	AN

DATA COLLECTION FORM
High School Sample - Pages 2-5

KEY AND CODES (Continued)

Column	Description	Code
3,5,7,9,11,13	Grade points earned in academic subjects	A-4 B-3 C-2 D-1 F-0
14-20	Enrollment units earned in non-academic, non-arts subjects	AN
14 - Typing		
15 - Drafting		
16 - Physical Education		
17 - Industrial Arts		
18 - Home Economics		
19 - Business Education		
20 - Other		
21-26	Enrollment units earned in arts subjects	AN
21 - General music		
22 - Choral music		
23 - Instrumental music		
24 - Other music		
25 - Art		
26 - Speech-Drama		

BOARD OF EDUCATION OF HARFORD COUNTY
45 EAST GORDON STREET
BEL AIR, MARYLAND 21014

MRS. JASON T. PATE, President, Havre de Grace
EDMUND H. SCHWANKE, Vice President, Abingdon
CLARK D. CONNELLEE, Aberdeen
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CHARLES F. NEALY, Aberdeen
DONALD G. RUSSELL, Darlington

CHARLES W. WILLIS
Superintendent

A. A. ROBERTY
Assistant Superintendent

The Registrar

Dear Sir:

We are conducting a follow-up study of students who graduated from three Harford County, Maryland high schools in June of 1963 and 1965. According to our records, the students listed on the attached form enrolled in your institution after graduation from high school. We would greatly appreciate your sending transcripts of the college work of these students. These need not be certified as official transcripts. We will, of course, be happy to pay any fees connected with this service. Please submit a statement of charges to the attention of the undersigned and prompt payment will be made.

Thank you for your cooperation in this matter.

Sincerely yours,

W. Warren Sprouse
Supervisor of Instruction

WWS:RMS
Att.

FILMED FROM BEST AVAILABLE COPY

TO:

W. Warren Sprouse
Instructional Supervisor
Board of Education of Harford County
45 East Gordon Street
Bel Air, Maryland 21014

FROM:

The Registrar

Enclosed are transcripts of the college work of the graduates of Harford County, Maryland high schools listed below.

Name	High School Grad. Class	Study File Number

PLEASE STRIKE THROUGH NAMES OF STUDENTS FOR WHOM YOU HAVE NO RECORD OF ENROLLMENT AT YOUR INSTITUTION.

BOARD OF EDUCATION OF HARFORD COUNTY
45 EAST GORDON STREET
BEL AIR, MARYLAND 21014

MRS. JASON T. PATE, President, Havre de Grace
EDMUND H. SCHWANKE, Vice President, Abingdon
CLARK D. CONNELLEE, Aberdeen
CORNELIUS F. CRONIN, Bel Air
W. MILES HANNA, Whiteford
CHARLES F. NEALY, Aberdeen
DONALD G. RUSSELL, Darlington

CHARLES W. WILLIS
Superintendent

A. A. ROBERTY
Assistant Superintendent

File No.

We are conducting a research study involving selected graduates of Harford County High Schools. Part of the data required is dependent upon an analysis of the college records of students selected for the study group. We would be most appreciative if you would grant permission for the registrar of your college to send us a copy of your college transcript.

All information contained on the transcript will be kept in strict confidence and used for statistical analysis only. No individual students will be identified in the research report.

If you do grant permission for us to request a copy of your transcript, our request to the college will be accompanied by a check for the usual transcript fee, so that no cost will be incurred by you in granting us the favor.

Please return the attached form indicating your decision in this matter. An addressed, postpaid envelope is enclosed. Your cooperation will be most appreciated.

Sincerely yours,

W. Warren Sprouse,
Instructional Supervisor

WWS:RMS
Enc. 2

To: W. Warren Sprouse
Board of Education of Harford County
Bel Air, Maryland 21014

(Please check one)

________ Permission is hereby GRANTED

________ Permission is DENIED

for you to request a copy of my college transcript from the Registrar of

I understand that I will not be charged a fee for the issuance of the transcript.

Signed ______________________________

Date ______________________________

Address ______________________________

____

COLLEGE DATA FORM - Page 1

(1)__________
ID. No.

(2)__________ __________ ______
Last Name First Name I.

College (s):

Data Set:

	Code		Code
(3) Location of College Entered		(19) - Grade Points	
(4) Type of College Entered		(20) Foreign Language - Hours Attempted	
(5) Specific Institution Entered		(21) - Grade Points	
(6) Number of Colleges Attended		(22) Choral Music - Hours	
(7) Transcript Available		(23) Instrumental Music - Hours	
(8) Reason Not Available		(24) Other Music - Hours	
(9) Enrollment Status		(25) Total Music - Hours	
(10) Number Semesters Enrolled		(26) Art - Hours	
(11) Record Complete		(27) Speech - Hours	
(12) English Journalism - Hours Attempted		(28) Drama Theatre - Hours	
(13) - Grade Points		(29) Other Arts - Hours	
(14) Social Science - Hours Attempted		(30) Total Arts - Hours	
(15) - Grade Points		(31) 20-30 Sem. Hours	
(16) Science Engineering - Hours Attempting		(32) 20-30 Sem. Hours	
(17) - Grade Points		(33) 30-Plus Sem. Hours	
(18) Mathematics - Hours Attempted		(34) 30-Plus Sem. Hours	

COLLEGE DATA FORM - Page 2

(1) 300
ID. No.

(2) ____________ ____________ ____
Last Name First Name I.

		Hr.	ENGLISH JOURNAL	ACADEMIC SUBJECTS
		G.P.		
		Hr.	SOCIAL SCIENCE	
		G.P.		
		Hr.	SCIENCE ENGINEER.	
		G.P.		
		Hr.	MATH	
		G.P.		
		Hr.	FOREIGN LANG.	
		G.P.		
		Choral Music	CM	ARTS SUBJECTS - Semes. Hours
		Instru. Music	IM	
		Other Music	OM	
		Art	AR	
		Speech	SP	
		Drama & Theatre	DT	
		Other Art	OA	
				OTHER 18+ Sem.Hr.

COLLEGE DATA SUMMARY FORM (Abridged)
Page 1

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
								ENGLISH		SOC.SCI.		SCIENCE	
Name	Sex	LC	TC	SI	NC	ES	NS	H	GP	H	GP	H	GP

COLLEGE DATA SUMMARY FORM (Abridged)
Page 2

(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
MATH		FOR.LANG.									
H	GP	H	GP	CM	IM	OM	TM	AT	SP	DT	OA

(27	(28)	(29)	(30)	(31)
AR	MI	MI	MJ	MJ

COLLEGE DATA CODE SHEET - Page 1

Column	Description	Code
1.	ID.NO. - Identification number of students in study population	AN*
	Student - Last Name, First, Initial	DO NOT PUNCH
2.	Sex	1-Male 2-Female
3.	LC - Location of College entered	1-Maryland 2-Out-of-State
4.	TC - Type of College entered	1-2-yr. Public 2-2-yr. Private 3-4-yr. State College 4-4-yr. Private College 5-State University 6-Private University 7-4-yr. Art Institute or Music Conservatory
5.	SI - Specific Institution entered	1-Harford Jr.College 2-University of Md. 3-Towson State
6.	NC - Number of Colleges Attended	1,2,etc.
7.	ES - Enrollment Status	1-Continuous 2-Withdrew
8.	NS - Number Semesters Enrolled	AN
9,11,13, 15,17	Total Semester Hours Attempted For Each Academic Subject	AN
10,12,14, 16,18	Total Grade Points For Each Academic Subject	AN

* Actual Number

COLLEGE DATA CODE SHEET - Page 2

Column	Description	Code
19.	CM - Choral Music - Semester Hours Enrolled	AN
20.	IM - Instrumental Music - Semester Hours Enrolled	AN
21.	OM - Other Music - Semester Hours Enrolled	AN
22.	TM - Music - Total Semester Hours Enrolled	AN
23.	AT - Art - Semester Hours Enrolled	AN
24.	SP - Speech - Semester Hours Enrolled	AN
25.	DT - Drama-Theatre - Semester Hours Enrolled	AN
26.	OA - Other Arts - Semester Hours Enrolled	AN
27.	AR - Arts Related - Design, Architecture, etc. - Semester Hours Enrolled	AN
28,29	MI - Minor Field of Study (20-30 Semester Hours)	**
30,31	MJ - Major Field of Study (30 or more Semester Hours)	**

** See College Fields of Study Codes on next page

COLLEGE DATA CODE SHEET - Page 3

College Fields of Study Codes

Major - 30 or more Semester Hours
Minor - 20-30 Semester Hours

Code	Field
1	English, Journalism
2	Social Sciences
3	Science, Engineering
4	Mathematics
5	Foreign Languages
6	Music
7	Art, Sculpture, etc.
8	Drama, Theatre
9	Fine Arts (arts survey, interrelated arts, etc.)
10	Arts Related (Architecture, Design, Interior Design, etc.)
11	Speech, Speech Therapy
12	Education
13	Psychology
14	Philosophy & Religion
15	Health, Physical Education, Recreation
16	Industrial Arts, Vocational Education
17	Home Economics, Nutrition, Food Management
18	Business Administration, Accounting, Industrial Management
19	Agriculture, Horticulture, Forestry, etc.
20	Library Science
21	Other

APPENDIX B

COLLEGES AND UNIVERSITIES INCLUDED IN SURVEY OF ENTRANCE REQUIREMENTS

Group A - Institutions With Most Competitive Admission Standards

Amherst College, Mass.
Bryn Mawr College, Pa.
California Institute of Technology, Calif.
Columbia College of Columbia University, N.Y.
Dartmouth College, N.H.
Harvard University, Mass.
Jackson College for Women, Mass.
Johns Hopkins University, Md.
Massachusetts Institute of Technology, Mass.
Mt. Holyoke College, Mass.
New College, Fla.
Pembroke College of Brown University, R.I.
Pomona College, Calif.
Princeton University, N.J.
Radcliffe College, Mass.
Rice University, Tex.
Smith College, Mass.
Stanford University, Calif.
Swarthmore College, Pa.
Webb Institute of Naval Architecture, N.Y.
Wellesley College, Mass.
Wesleyan University, Conn.
Williams College, Mass.
Yale University, Conn.

Group B - Institutions With Highly Competitive Admission Standards

Alleghney College, Pa.
Barnard College, N.Y.
Bowdoin College, Me.
Bucknell University, Pa.
Case Institute of Technology, Ohio
Colby College, Me.
Connecticut College, Conn.
Denison University, Ohio
Duke University, N.C.
Goucher College, Md.
Harpur College, N.Y.
Hobart College, N.Y.
Kenyon College, Ohio
Lehigh University, Pa.
Northwestern University, Ill.
Reed College, Ore.
Sarah Lawrence College, N.Y.
Skidmore College, N.Y.
Trinity College, Conn.
Union College, N.Y.
University of Chicago, Ill.
University of Virginia, Va.
Washington and Lee University, Va.
Wheaton College, Mass.

COLLEGES AND UNIVERSITIES INCLUDED IN SURVEY OF ENTRANCE REQUIREMENTS, (Continued)

Group C - Institutions With Very Competitive Admission Standards

Agnes Scott College, Ga.
Albright College, Pa.
Beaver College, Pa.
Boston University, Mass.
Catholic University of America, D.C.
Chestnut Hill College, Pa.
College of Mt. St. Vincent, N.Y.
College of William and Mary, Va.
Colorado School of Mines, Col.
De Pauw University, Ind.
Drexel Institute of Technology, Pa.
Emory University, Ga.
Florida Presbyterian College, Fla.
George Washington University, D.C.
Goddard College, Vt.
Hanover College, Ind.
Hood College, Md.
Iowa State University of Science, Iowa
Lake Erie College, Ohio
Lebanon Valley College, Pa.
Lewis and Clark College, Ore.
Manhattan College, N.Y.
Mary Baldwin College, Va.
Marymount Manhattan College, N.Y.
Muhlenberg College, Pa.
New York University, N.Y.
Ohio Wesleyan University, Ohio
Polytechnic Institute of Brooklyn, N.Y.
Principia College, Ill.
Randolph-Macon Woman's College, Va.
Ripon College, Wisc.
Rutgers, the State University of New Jersey, N.J.
St. Joseph's College, Me.
St. Mary's College, Ind.
Scripps College, Calif.
State University of New York at Buffalo, N.Y.
State University of New York at Genesco, N.Y.
Stetson University, Fla.
Sweet Briar College, Va.
Tulane University, La.
University of California at Irvine, Calif.
University of California at San Diego, Calif.
University of Illinois, Ill.
University of Massachusetts, Mass.
University of Maryland, Md.
University of North Carolina at Chapel Hill, N.C.
University of Pittsburg, Pa.
University of Santa Clara, Calif.
University of the South, Tenn.
University of Wisconsin at Madison, Wisc.
Virginia Military Institute, Va.
Washington College, Md.
Western Maryland College, Md.
Whitman College, Wash.
Wilson College, Pa.

COLLEGES AND UNIVERSITIES INCLUDED IN SURVEY OF ENTRANCE REQUIREMENTS, (Continued)

Group D - Institutions With Competitive Admission Standards

Adelphi University, N.Y.
American University, D.C.
Ashland College, Ohio
Aurora College, Ill.
Baldwin-Wallace College, Ohio
Baylor University, Tex.
Bethel College, Minn.
Bloomsburg State College, Pa.
Briarcliff College, N.Y.
Butler University, Ind.
California Luthern College, Calif.
California State College at Los Angeles
Campbell College, N.C.
Carthage College, Wis.
Centenary College of Louisiana, La.
Chico State College, Calif.
Cleveland State University, Ohio
College of Emporia, Kan.
College of Our Lady of the Elms, Mass.
College of St. Teresa, Minn.
Colorado State University, Col.
Dana College, Neb.
Dominican College, Wis.
Duquesne University, Pa.
Eastern Mennonite College, Va.
Elizabethtown College, Pa.
Emory & Henry College, Va.
Findlay College, Ohio
Fresno State College, Calif.
George Mason College, Va.
Good Counsel College, N.Y.
Guilford College, N.C.
Heidleberg College, Ohio
Hiram College, Ohio
Illinois College, Ill.
Indiana Institute of Technology, Ind.
Ithaca College, N.Y.
John Carroll University, Ohio
King College, Tenn.
La Verne College, Calif.
Lenoir Rhyne College, N.C.
Loras College, Iowa
Loyola University of Los Angeles, Calif.
Malone College, Ohio
Marist College, N.Y.
Maryville College, Tenn.
Messiah College, Pa.
Millsaps College, Miss.
Montana College of Mineral Science and Technology, Mont.
Morris Harvey College, W. Va.
Muskingum College, Ohio
New England College, N.H.
North Dakota State University, N.D.
Northrop Institute of Technology, Calif.
Ohio Dominican College, Ohio
Otterbein College, Ohio
Pacific College, Calif.
Pepperdine College, Calif.
Purdue University, Ind.
Rhode Island College, R.I.
Rollins College, Fla.
Sacred Heart Dominican College, Tex.
St. Francis College, N.Y.
St. John's University, N.Y.
St. Leo College, Fla.
St. Mary's College, Minn.
St. Norbert College, Wis.
Salve Regina College, R.I.
San Francisco College for Women, Calif.
Seton Hall University, N.J.
Simpson College, Iowa
Southern Connecticut State College, Conn.
Spring Hill College, Ala.
State College at Fitchburg, Mass.
State College at Westfield, Mass.
State University of New York College at Oneonta, N.Y.
Stonehill College, Mass.
Tennessee Wesleyan College, Tenn.
Towson State College, Md.

COLLEGES AND UNIVERSITIES INCLUDED IN SURVEY OF ENTRANCE REQUIREMENTS, (Continued)

Group D - Institutions With Competitive Admission Standards, (Continued)

University of Akron, Ohio
University of Dallas, Tex.
University of Dubuque, Iowa
University of Hawaii, Hawaii
University of Louisville, Ky.
University of Montana, Mont.
University of Northern Iowa, Iowa
University of Rhode Island, R.I.
University of Texas at Arlington, Tex
University of Wisconsin, Milwaukee, Wis.
Ursuline College for Women, Ohio
Virginia Polytechnic Institute, Va.
Webster College, Mo.
Western Connecticut State College, Conn.
Westminster College, Pa.
Whitworth College, Wash.
Wilmington College, N.C.
Wittenberg University, Ohio

APPENDIX C

REGRESSION ANALYSIS TABLES

Tables 42-53

Page

Analyses for Students with Continuous Enrollment in College 310

Analyses for Students who Withdrew From College 328

TABLE 42

ANALYSES OF THE EFFECTS OF PREDICTOR VARIABLES ON COLLEGE GPA IN ENGLISH FOR STUDENTS WITH CONTINUOUS ENROLLMENT IN COLLEGE

Predictor Variables:

1 Unit vector
2 I.Q. (Otis)
3 Sex
4 Four college semester
5 Eight college semester
6 High level of enrollment in high school subject
7 Other than high level of enrollment in high school subject

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ARTS							
Full Model	7	.1367					
Restricted Models - All variables except:							
2-I.Q.	6	.0472	24.0474	1	232	.0000	**
3-Sex	6	.1229	3.7083	1	232	.0554	
4,5-Sem. in College	5	.1293	1.9797	1	232	.1608	
6,7-Enrollment Level	5	.1335	0.8680	1	232	.3525	
PHYSICAL EDUCATION							
Full Model	7	.1555					
Restricted Models - All variables except:							
2-I.Q.	6	.0729	22.6959	1	232	.0000	**
3-Sex	6	.1440	3.1469	1	232	.0773	
4,5-Sem. in College	5	.1455	2.7332	1	232	.0996	
6,7-Enrollment Level	5	.1335	6.0534	1	232	.0146	

(Table cont'd.)

Table 42 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ENGLISH							
Full Model	7	.1373					
Restricted Models - All variables except:							
2-I.Q.	6	.0532	22.5898	1	232	.0000	**
3-Sex	6	.1267	2.8401	1	232	.0933	
4,5-Sem. in College	5	.1273	2.6856	1	232	.1026	
6,7-Enrollment Level	5	.1335	1.0228	1	232	.3129	
SOCIAL SCIENCE							
Full Model	7	.1357					
Restricted Models - All variables except:							
2-I.Q.	6	.0503	22.9047	1	232	.0000	**
3-Sex	6	.1224	3.5624	1	232	.0603	
4,5-Sem. in College	5	.1290	1.7982	1	232	.1812	
6,7-Enrollment Level	5	.1335	0.5967	1	232	.4406	
SCIENCE							
Full Model	7	.1336					
Restricted Models - All variables except:							
2-I.Q.	6	.0435	24.1288	1	232	.0000	**
3-Sex	6	.1211	3.3349	1	232	.0691	
4,5-Sem. in College	5	.1264	1.9120	1	232	.1680	
6,7-Enrollment Level	5	.1335	0.0372	1	232	.8472	

(Table cont'd.)

Table 42 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
MATHEMATICS							
Full Model	7	.1404					
Restricted Models - All variables except:							
2-I.Q.	6	.0753	17.5585	1	232	.0000	**
3-Sex	6	.1246	4.2694	1	232	.0399	*
4,5-Sem. in College	5	.1317	2.3350	1	232	.1278	
6,7-Enrollment Level	5	.1335	1.8675	1	232	.1731	
FOREIGN LANGUAGE							
Full Model	7	.1694					
Restricted Models - All variables except:							
2-I.Q.	6	.0984	19.8520	1	232	.0000	**
3-Sex	6	.1645	1.3766	1	232	.2419	
4,5-Sem. in College	5	.1652	1.1932	1	232	.2758	
6,7-Enrollment Level	5	.1335	10.0553	1	232	.0017	**

TABLE 43

ANALYSES OF THE EFFECTS OF PREDICTOR VARIABLES ON COLLEGE GPA IN SOCIAL SCIENCE FOR STUDENTS WITH CONTINUOUS ENROLLMENT IN COLLEGE

Predictor Variables:

1 Unit vector
2 I.Q. (Otis)
3 Sex
4 Four college semester
5 Eight college semester
6 High level of enrollment in high school subject
7 Other than high level of enrollment in high school subject

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ARTS							
Full Model	7	.0162					
Restricted Models - All variables except:							
2-I.Q.	6	.0156	.1361	1	232	.7125	
3-Sex	6	.0162	.0005	1	232	.9821	
4,5-Sem. in College	5	.0051	2.6113	1	232	.1075	
6,7-Enrollment Level	5	.0126	.8398	1	232	.3604	
PHYSICAL EDUCATION							
Full Model	7	.0129					
Restricted Models - All variables except:							
2-I.Q.	6	.0123	.1305	1	232	.7182	
3-Sex	6	.0129	.0065	1	232	.9359	
4,5-Sem. in College	5	.0020	2.5699	1	232	.1103	
6,7-Enrollment Level	5	.0126	.0688	1	232	.7934	

(Table cont'd.)

Table 43 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ENGLISH							
Full Model	7	.0145					
Restricted Models - All variables except:							
2-I.Q.	6	.0141	.0877	1	232	.7674	
3-Sex	6	.0143	.0317	1	232	.8588	
4,5-Sem. in College	5	.0070	1.7625	1	232	.1856	
6,7-Enrollment Level	5	.0126	.4387	1	232	.5084	
SOCIAL SCIENCE							
Full Model	7	.0158					
Restricted Models - All variables except:							
2-I.Q.	6	.0155	.0756	1	232	.7836	
3-Sex	6	.0158	.0035	1	232	.9526	
4,5-Sem. in College	5	.0038	2.8318	1	232	.0937	
6,7-Enrollment Level	5	.0126	.7506	1	232	.3872	
SCIENCE							
Full Model	7	.0179					
Restricted Models - All variables except:							
2-I.Q.	6	.0170	.2131	1	232	.6448	
3-Sex	6	.0176	.0587	1	232	.8087	
4,5-Sem. in College	5	.0069	2.6001	1	232	.1082	
6,7-Enrollment Level	5	.0126	1.2502	1	232	.2647	

(Table cont'd.)

Table 43 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
MATHEMATICS							
Full Model	7	.0132					
Restricted Models - All variables except:							
2-I.Q.	6	.0122	.2351	1	232	.6282	
3-Sex	6	.0131	.0145	1	232	.9044	
4,5-Sem. in College	5	.0013	2.7969	1	232	.0958	
6,7-Enrollment Level	5	.0126	.1373	1	232	.7155	
FOREIGN LANGUAGE							
Full Model	7	.0228					
Restricted Models - All variables except:							
2-I.Q.	6	.0227	.0185	1	232	.8921	
3-Sex	6	.0221	.1672	1	232	.6830	
4,5-Sem. in College	5	.0093	3.2135	1	232	.0743	
6,7-Enrollment Level	5	.0126	2.4209	1	232	.1211	

TABLE 44

ANALYSES OF THE EFFECTS OF PREDICTOR VARIABLES ON COLLEGE GPA IN SCIENCE FOR STUDENTS WITH CONTINUOUS ENROLLMENT IN COLLEGE

Predictor Variables:

1	Unit vector	6	High level of enrollment in high school subject
2	I.Q. (Otis)	7	Other than high level of enrollment in high school subject
3	Sex		
4	Four college semester		
5	Eight college semester		

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ARTS							
Full Model	7	.0124					
Restricted Models - All variables except:							
2-I.Q.	6	.0066	1.3632	1	232	.2442	
3-Sex	6	.0103	.5091	1	232	.4763	
4,5-Sem. in College	5	.0122	.0666	1	232	.7966	
6,7-Enrollment Level	5	.0101	.5444	1	232	.4614	
PHYSICAL EDUCATION							
Full Model	7	.0146					
Restricted Models - All variables except:							
2-I.Q.	6	.0095	1.2025	1	232	.2740	
3-Sex	6	.0129	.3920	1	232	.5319	
4,5-Sem. in College	5	.0144	.0284	1	232	.8662	
6,7-Enrollment Level	5	.0101	1.0442	1	232	.3079	

(Table cont'd.)

Table 44 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ENGLISH							
Full Model	7	.0104					
Restricted Models - All variables except:							
2-I.Q.	6	.0049	1.2949	1	232	.2563	
3-Sex	6	.0087	.3936	1	232	.5311	
4,5-Sem. in College	5	.0102	.0332	1	232	.8557	
6,7-Enrollment Level	5	.0101	.0591	1	232	.8081	
SOCIAL SCIENCE							
Full Model	7	.0116					
Restricted Models - All variables except:							
2-I.Q.	6	.0050	1.5426	1	232	.2155	
3-Sex	6	.0097	.4559	1	232	.5002	
4,5-Sem. in College	5	.0013	.0635	1	232	.8013	
6,7-Enrollment Level	5	.0101	.3450	1	232	.5576	
SCIENCE							
Full Model	7	.0111					
Restricted Models - All variables except:							
2-I.Q.	6	.0056	1.3030	1	232	.2549	
3-Sex	6	.0088	.5570	1	232	.4563	
4,5-Sem. in College	5	.0108	.0855	1	232	.7703	
6,7-Enrollment Level	5	.0101	.2342	1	232	.6289	

(Table cont'd.)

Table 44 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
MATHEMATICS							
Full Model	7	.0288					
Restricted Models - All variables except:							
2-I.Q.	6	.0281	.1725	1	232	.6783	
3-Sex	6	.0248	.9707	1	232	.3255	
4,5-Sem. in College	5	.0288	.0018	1	232	.9658	
6,7-Enrollment Level	5	.0101	4.4666	1	232	.0356	*
FOREIGN LANGUAGE							
Full Model	7	.0110					
Restricted Models - All variables except:							
2-I.Q.	6	.0059	1.1953	1	232	.2754	
3-Sex	6	.0097	.3163	1	232	.5744	
4,5-Sem. in College	5	.0106	.1039	1	232	.7475	
6,7-Enrollment Level	5	.0101	.2037	1	232	.6521	

TABLE 45

ANALYSES OF THE EFFECTS OF PREDICTOR VARIABLES ON COLLEGE GPA IN MATHEMATICS FOR STUDENTS WITH CONTINUOUS ENROLLMENT IN COLLEGE

Predictor Variables:

1 Unit vector
2 I.Q. (Otis)
3 Sex
4 Four college semester
5 Eight college semester
6 High level of enrollment in high school subject
7 Other than high level of enrollment in high school subject

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ARTS							
Full Model	7	.0663					
Restricted Models - All variables except:							
2-I.Q.	6	.0296	9.1071	1	232	.0028	**
3-Sex	6	.0633	.7439	1	232	.3893	
4,5-Sem. in College	5	.0550	2.7964	1	232	.0958	
6,7-Enrollment Level	5	.0582	1.9904	1	232	.1596	
PHYSICAL EDUCATION							
Full Model	7	.0585					
Restricted Models - All variables except:							
2-I.Q.	6	.0220	8.9959	1	232	.0030	**
3-Sex	6	.0560	.6068	1	232	.4368	
4,5-Sem. in College	5	.0472	2.7914	1	232	.0961	
6,7-Enrollment Level	5	.0582	.0610	1	232	.8051	

(Table cont'd.)

Table 45 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ENGLISH							
Full Model	7	.0584					
Restricted Models - All variables except:							
2-I.Q.	6	.0225	8.8504	1	232	.0032	**
3-Sex	6	.0562	.5517	1	232	.4584	
4,5-Sem. in College	5	.0489	2.3539	1	232	.1263	
6,7-Enrollment Level	5	.0582	.0508	1	232	.8220	
SOCIAL SCIENCE							
Full Model	7	.0587					
Restricted Models - All variables except:							
2-I.Q.	6	.0210	9.2895	1	232	.0026	**
3-Sex	6	.0562	.6253	1	232	.4299	
4,5-Sem. in College	5	.0471	2.8541	1	232	.0925	
6,7-Enrollment Level	5	.0582	.1171	1	232	.7325	
SCIENCE							
Full Model	7	.0701					
Restricted Models - All variables except:							
2-I.Q.	6	.0300	9.9902	1	232	.0018	**
3-Sex	6	.0690	.2666	1	232	.6061	
4,5-Sem. in College	5	.0589	2.7835	1	232	.0966	
6,7-Enrollment Level	5	.0582	2.9591	1	232	.0867	

(Table cont'd.)

Table 45 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
MATHEMATICS							
Full Model	7	.0957					
Restricted Models - All variables except:							
2-I.Q.	6	.0819	3.5327	1	232	.0617	
3-Sex	6	.0896	1.5661	1	232	.2124	
4,5-Sem. in College	5	.8823	1.9116	1	232	.1681	
6,7-Enrollment Level	5	.0582	9.6057	1	232	.0022	**
FOREIGN LANGUAGE							
Full Model	7	.0610					
Restricted Models - All variables except:							
2-I.Q.	6	.0278	8.2035	1	232	.0046	**
3-Sex	6	.0596	.3489	1	232	.5553	
4,5-Sem. in College	5	.0481	3.1175	1	232	.0760	
6,7-Enrollment Level	5	.0582	.6922	1	232	.4063	

TABLE 46

ANALYSES OF THE EFFECTS OF PREDICTOR VARIABLES ON COLLEGE GPA IN FOREIGN LANGUAGE FOR STUDENTS WITH CONTINUOUS ENROLLMENT IN COLLEGE

Predictor Variables:

1 Unit vector
2 I.Q. (Otis)
3 Sex
4 Four college semester
5 Eight college semester
6 High level of enrollment in high school subject
7 Other than high level of enrollment in high school subject

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ARTS							
Full Model	7	.0740					
Restricted Models - All variables except:							
2-I.Q.	6	.0374	9.1777	1	232	.0027	**
3-Sex	6	.0606	3.3704	1	232	.0676	
4,5-Sem. in College	5	.0615	3.1334	1	232	.0780	
6,7-Enrollment Level	5	.0739	.0444	1	232	.8332	
PHYSICAL EDUCATION							
Full Model	7	.0795					
Restricted Models - All variables except:							
2-I.Q.	6	.0454	8.5930	1	232	.0037	**
3-Sex	6	.0668	3.1994	1	232	.0750	
4,5-Sem. in College	5	.0690	2.6573	1	232	.1044	
6,7-Enrollment Level	5	.0739	1.4322	1	232	.2326	

(Table cont'd.)

Table 46 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ENGLISH							
Full Model	7	.0763					
Restricted Models - All variables except:							
2-I.Q.	6	.0426	8.4474	1	232	.0040	**
3-Sex	6	.0649	2.8592	1	232	.0922	
4,5-Sem. in College	5	.0684	1.9757	1	232	.1612	
6,7-Enrollment Level	5	.0739	.6072	1	232	.4367	
SOCIAL SCIENCE							
Full Model	7	.0801					
Restricted Models - All variables except:							
2-I.Q.	6	.0477	8.1831	1	232	.0046	**
3-Sex	6	.0664	3.4686	1	232	.0638	
4,5-Sem. in College	5	.0669	3.3441	1	232	.0687	
6,7-Enrollment Level	5	.0738	1.5846	1	232	.2094	
SCIENCE							
Full Model	7	.0858					
Restricted Models - All variables except:							
2-I.Q.	6	.0465	9.9922	1	232	.0018	**
3-Sex	6	.0762	2.4370	1	232	.1199	
4,5-Sem. in College	5	.0741	2.9769	1	232	.0858	
6,7-Enrollment Level	5	.0739	3.0400	1	232	.0826	

(Table cont'd.)

Table 46 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Proba-bility	Signif. * .05 ** .01
MATHEMATICS							
Full Model	7	.0752					
Restricted Models - All variables except:							
2-I.Q.	6	.0469	7.0844	1	232	.0114	**
3-Sex	6	.0606	3.6613	1	232	.0569	
4,5-Sem. in College	5	.0638	2.8551	1	232	.0924	
6,7-Enrollment Level	5	.0739	.3330	1	232	.5645	
FOREIGN LANGUAGE							
Full Model	7	.1205					
Restricted Models - All variables except:							
2-I.Q.	6	.0965	6.3312	1	232	.0125	**
3-Sex	6	.1161	1.1565	1	232	.2833	
4,5-Sem. in College	5	.1031	4.5923	1	232	.0332	*
6,7-Enrollment Level	5	.0739	12.3023	1	232	.0005	**

TABLE 47

ANALSES OF THE EFFECTS OF PREDICTOR VARIABLES ON COLLEGE GPA IN ACADEMIC SUBJECTS FOR STUDENTS WITH CONTINUOUS ENROLLMENT IN COLLEGE

Predictor Variables:

1 Unit vector
2 I.Q. (Otis)
3 Sex
4 Four college semester
5 Eight college semester
6 High level of enrollment in high school subject
7 Other than high level of enrollment in high school subject

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ARTS							
Full Model	7	.0614					
Restricted Models - All variables except:							
2-I.Q.	6	.0172	10.9178	1	232	.0011	**
3-Sex	6	.0561	1.3044	1	232	.2546	
4,5-Sem. in College	5	.0591	.5728	1	232	.2546	
6,7-Enrollment Level	5	.0613	.0301	1	232	.8625	
PHYSICAL EDUCATION							
Full Model	7	.0728					
Restricted Models - All variables except:							
2-I.Q.	6	.0323	10.1320	1	232	.0016	**
3-Sex	6	.0684	1.1070	1	232	.2938	
4,5-Sem. in College	5	.0715	.3349	1	232	.5634	
6,7-Enrollment Level	5	.0613	2.8865	1	232	.0907	

(Table cont'd.)

Table 47 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ENGLISH							
Full Model	7	.0639					
Restricted Models - All variables except:							
2-I.Q.	6	.0231	10.1271	1	232	.0016	**
3-Sex	6	.0600	.9660	1	232	.3267	
4,5-Sem. in College	5	.0631	.2023	1	232	.6533	
6,7-Enrollment Level	5	.0613	.6551	1	232	.4191	
SOCIAL SCIENCE							
Full Model	7	.0670					
Restricted Models - All variables except:							
2-I.Q.	6	.0272	9.9072	1	232	.0018	**
3-Sex	6	.0617	1.3140	1	232	.2528	
4,5-Sem. in College	5	.0643	.6733	1	232	.4127	
6,7-Enrollment Level	5	.0613	1.4178	1	232	.2350	
SCIENCE							
Full Model	7	.0654					
Restricted Models - All variables except:							
2-I.Q.	6	.0195	11.4096	1	232	.0008	**
3-Sex	6	.0617	.9275	1	232	.3365	
4,5-Sem. in College	5	.0633	.5397	1	232	.4633	
6,7-Enrollment Level	5	.0613	1.0306	1	232	.3111	

(Table cont'd.)

Table 47 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
MATHEMATICS							
Full Model	7	.0736					
Restricted Models - All variables except:							
2-I.Q.	6	.0476	6.5099	1	232	.0014	**
3-Sex	6	.0659	1.9205	1	232	.1167	
4,5-Sem. in College	5	.0723	.3193	1	232	.5726	
6,7-Enrollment Level	5	.0613	3.0820	1	232	.0805	
FOREIGN LANGUAGE							
Full Model	7	.0823					
Restricted Models - All variables except:							
2-I.Q.	6	.0480	8.6599	1	232	.0036	**
3-Sex	6	.0808	.3742	1	232	.5413	
4,5-Sem. in College	5	.0784	.9821	1	232	.3227	
6,7-Enrollment Level	5	.0613	5.2993	1	232	.0222	*

TABLE 48

ANALYSES OF THE EFFECTS OF PREDICTOR VARIABLES ON COLLEGE GPA IN ENGLISH FOR STUDENTS WHO WITHDREW FROM COLLEGE

Predictor Variables:

1 Unit vector
2 I.Q. (Otis)
3 Sex
4 High level of enrollment in high school subject
5 Other than high level of enrollment in high school subject

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ARTS							
Full Model	5	.1150					
Restricted Models - All variables except:							
2-I.Q.	4	.0713	6.0209	1	122	.0155	*
3-Sex	4	.0621	7.2966	1	122	.0079	**
4,5-Enrollment Level	3	.1085	6.4469	2	122	.6406	
PHYSICAL EDUCATION							
Full Model	5	.1104					
Restricted Models - All variables except:							
2-I.Q.	4	.0704	5.4771	1	122	.0209	*
3-Sex	4	.0557	7.5009	1	122	.0071	**
4,5-Enrollment Level	3	.1085	.1254	2	122	.8823	

(Table cont'd.)

Table 48 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ENGLISH							
Full Model	5	.1336					
Restricted Models - All variables except:							
2-I.Q.	4	.1049	4.0374	1	122	.0467	*
3-Sex	4	.0928	5.7413	1	122	.0181	*
4,5-Enrollment Level	3	.1085	1.7619	2	122	.1761	
SOCIAL SCIENCE							
Full Model	5	.1347					
Restricted Models - All variables except:							
2-I.Q.	4	.0996	4.9553	1	122	.0278	*
3-Sex	4	.0833	7.2482	1	122	.0081	**
4,5-Enrollment Level	3	.1085	1.8477	2	122	.1620	
SCIENCE							
Full Model	5	.1101					
Restricted Models - All variables except:							
2-I.Q.	4	.0636	6.3679	1	122	.0129	**
3-Sex	4	.0527	7.8660	1	122	.0058	**
4,5-Enrollment Level	3	.1085	.1058	2	122	.8997	

(Table cont'd.)

Table 48 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
MATHEMATICS							
Full Model	5	.1364					
Restricted Models - All variables except:							
2-I.Q.	4	.1073	4.1095	1	122	.0448	*
3-Sex	4	.0731	8.9501	1	122	.0034	**
4,5-Enrollment Level	3	.1085	1.9699	2	122	.1439	
FOREIGN LANGUAGE							
Full Model	5	.1140					
Restricted Models - All variables except:							
2-I.Q.	4	.0756	5.2839	1	122	.0232	*
3-Sex	4	.0651	6.7223	1	122	.0107	**
4,5-Enrollment Level	3	.1085	.3726	2	122	.6897	

TABLE 49

ANALYSES OF THE EFFECTS OF PREDICTOR VARIABLES ON COLLEGE GPA IN SOCIAL SCIENCE FOR STUDENTS WHO WITHDREW FROM COLLEGE

Predictor Variables:

1 Unit vector
2 I.Q. (Otis)
3 Sex
4 High level of enrollment in high school subject
5 Other than high level of enrollment in high school subject

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ARTS							
Full Model	5	.0330					
Restricted Models - All variables except:							
2-I.Q.	4	.0156	2.1891	1	122	.1416	
3-Sex	4	.0236	1.1777	1	122	.2800	
4,5-Enrollment Level	3	.0248	.5143	2	122	.5992	
PHYSICAL EDUCATION							
Full Model	5	.0250					
Restricted Models - All variables except:							
2-I.Q.	4	.0014	1.7081	1	122	.1937	
3-Sex	4	.0171	.9917	1	122	.3213	
4,5-Enrollment Level	3	.0248	.0156	2	122	.9845	

(Table cont'd.)

Table 49 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ENGLISH							
Full Model	5	.0370					
Restricted Models - All variables except:							
2-I.Q.	4	.0285	1.0756	1	122	.3012	
3-Sex	4	.0325	.5709	1	122	.4513	
4,5-Enrollment Level	3	.0248	.7751	2	122	.4629	
SOCIAL SCIENCE							
Full Model	5	.0545					
Restricted Models - All variables except:							
2-I.Q.	4	.0455	1.1566	1	122	.2843	
3-Sex	4	.0481	.8196	1	122	.3671	
4,5-Enrollment Level	3	.0248	1.9135	2	122	.1512	
SCIENCE							
Full Model	5	.0302					
Restricted Models - All variables except:							
2-I.Q.	4	.1042	2.0123	1	122	.1586	
3-Sex	4	.0252	.6370	1	122	.4264	
4,5-Enrollment Level	3	.0248	.3426	2	122	.7106	

(Table cont'd.)

Table 49 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
MATHEMATICS							
Full Model	5	.0250					
Restricted Models - All variables except:							
2-I.Q.	4	.0111	1.7324	1	122	.1906	
3-Sex	4	.0167	1.0348	1	122	.3110	
4,5-Enrollment Level	3	.0248	.0107	2	122	.9893	
FOREIGN LANGUAGE							
Full Model	5	.0271					
Restricted Models - All variables except:							
2-I.Q.	4	.0147	1.5519	1	122	.2152	
3-Sex	4	.0206	.8175	1	122	.3677	
4,5-Enrollment Level	3	.0248	.1431	2	122	.8668	

TABLE 50

ANALYSES OF THE EFFECTS OF PREDICTOR VARIABLES ON COLLEGE GPA IN SCIENCE FOR STUDENTS WHO WITHDREW FROM COLLEGE

Predictor Variables:

1 Unit vector
2 I.Q. (Otis)
3 Sex
4 High level of enrollment in high school subject
5 Other than high level of enrollment in high school subject

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Proba-bility	Signif. * .05 ** .01
ARTS							
Full Model	5	.0223					
Restricted Models - All variables except:							
2-I.Q.	4	.0025	2.4608	1	122	.1193	
3-Sex	4	.0222	.0096	1	122	.9221	
4,5-Enrollment Level	3	.0211	.0746	2	122	.9281	
PHYSICAL EDUCATION							
Full Model	5	.0328					
Restricted Models - All variables except:							
2-I.Q.	4	.0120	1.6195	1	122	.2056	
3-Sex	4	.0328	.0032	1	122	.9548	
4,5-Enrollment Level	3	.0211	.7400	2	122	.4792	

(Table cont'd.)

Table 50 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ENGLISH							
Full Model	5	.0249					
Restricted Models - All variables except:							
2-I.Q.	4	.0097	1.9074	1	122	.1698	
3-Sex	4	.0249	.0000	1	122	.9937	
4,5-Enrollment Level	3	.0211	.2392	2	122	.7877	
SOCIAL SCIENCE							
Full Model	5	.0269					
Restricted Models - All variables except:							
2-I.Q.	4	.0101	2.1056	1	122	.1493	
3-Sex	4	.0269	.0059	1	122	.9391	
4,5-Enrollment Level	3	.0211	.3651	2	122	.6949	
SCIENCE							
Full Model	5	.0340					
Restricted Models - All variables except:							
2-I.Q.	4	.0142	2.4975	1	122	.1166	
3-Sex	4	.0327	.1704	1	122	.6805	
4,5-Enrollment Level	3	.0211	.8175	2	122	.4439	

(Table cont'd.)

Table 50 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
MATHEMATICS							
Full Model	5	.0867					
Restricted Models - All variables except:							
2-I.Q.	4	.0805	.8246	1	122	.3656	
3-Sex	4	.0854	.1723	1	122	.6788	
4,5-Enrollment Level	3	.0211	4.3823	2	122	.0145	**
FOREIGN LANGUAGE							
Full Model	5	.0308					
Restricted Models - All variables except:							
2-I.Q.	4	.0165	1.7954	1	122	.1828	
3-Sex	4	.0308	.0037	1	122	.9517	
4,5-Enrollment Level	3	.0211	.6122	2	122	.5438	

TABLE 51

ANALYSES OF THE EFFECTS OF PREDICTOR VARIABLES ON COLLEGE GPA IN MATHEMATICS FOR STUDENTS WHO WITHDREW FROM COLLEGE

Predictor Variables:

1 Unit vector
2 I.Q. (Otis)
3 Sex
4 High level of enrollment in high school subject
5 Other than high level of enrollment in high school subject

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ARTS							
Full Model	5	.0794					
Restricted Models - All variables except:							
2-I.Q.	4	.0222	7.5826	1	122	.0068	**
3-Sex	4	.0675	1.5753	1	122	.2118	
4,5-Enrollment Level	3	.0760	.2213	2	122	.8018	
PHYSICAL EDUCATION							
Full Model	5	.0760					
Restricted Models - All variables except:							
2-I.Q.	4	.0199	7.4167	1	122	.0074	**
3-Sex	4	.0632	1.6953	1	122	.1954	
4,5-Enrollment Level	3	.0760	.0006	2	122	.9994	

(Table cont'd.)

Table 51 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ENGLISH							
Full Model	5	.0854					
Restricted Models - All variables except:							
2-I.Q.	4	.0404	6.0142	1	122	.0156	*
3-Sex	4	.0768	1.1513	1	122	.2854	
4,5-Enrollment Level	3	.0760	.6280	2	122	.5354	
SOCIAL SCIENCE							
Full Model	5	.0764					
Restricted Models - All variables except:							
2-I.Q.	4	.0194	7.5305	1	122	.0069	**
3-Sex	4	.0638	1.6678	1	122	.1990	
4,5-Enrollment Level	3	.0760	.0233	2	122	.9769	
SCIENCE							
Full Model	5	.0861					
Restricted Models - All variables except:							
2-I.Q.	4	.0275	7.8255	1	122	.0060	**
3-Sex	4	.0683	2.3752	1	122	.1259	
4,5-Enrollment Level	3	.0760	.6735	2	122	.5118	

(Table cont'd.)

Table 51 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
MATHEMATICS							
Full Model	5	.1240					
Restricted Models - All variables except:							
2-I.Q.	4	.0895	4.8018	1	122	.0303	*
3-Sex	4	.1060	2.5006	1	122	.1160	
4,5-Enrollment Level	3	.0760	3.3372	2	122	.0388	*
FOREIGN LANGUAGE							
Full Model	5	.0948					
Restricted Models - All variables except:							
2-I.Q.	4	.0226	9.7398	1	122	.0023	**
3-Sex	4	.0765	2.4635	1	122	.1191	
4,5-Enrollment Level	3	.0760	1.2666	2	122	.2855	

TABLE 52

ANALYSES OF THE EFFECTS OF PREDICTOR VARIABLES ON COLLEGE GPA IN FOREIGN LANGUAGE FOR STUDENTS WHO WITHDREW FROM COLLEGE

Predictor Variables:

1 Unit vector
2 I.Q. (Otis)
3 Sex
4 High level of enrollment in high school subject
5 Other than high level of enrollment in high school subject

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ARTS							
Full Model	5	.1310					
Restricted Models - All variables except:							
2-I.Q.	4	.0748	7.8959	1	122	.0058	**
3-Sex	4	.0685	8.7814	1	122	.0037	**
4,5-Enrollment Level	3	.1160	1.0574	2	122	.3505	
PHYSICAL EDUCATION							
Full Model	5	.1208					
Restricted Models - All variables except:							
2-I.Q.	4	.0794	5.7528	1	122	.0180	*
3-Sex	4	.0646	7.7997	1	122	.0060	**
4,5-Enrollment Level	3	.1160	.3389	2	122	.7133	

(Table cont'd.)

Table 52 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ENGLISH							
Full Model	5	.1399					
Restricted Models - All variables except:							
2-I.Q.	4	.1073	4.6220	1	122	.0335	*
3-Sex	4	.0970	6.0946	1	122	.0149	**
4,5-Enrollment Level	3	.1160	1.7000	2	122	.1870	
SOCIAL SCIENCE							
Full Model	5	.1168					
Restricted Models - All variables except:							
2-I.Q.	4	.0685	6.6700	1	122	.0110	**
3-Sex	4	.0594	7.9200	1	122	.0057	**
4,5-Enrollment Level	3	.1160	.0557	2	122	.9459	
SCIENCE							
Full Model	5	.1371					
Restricted Models - All variables except:							
2-I.Q.	4	.0835	7.5770	1	122	.0068	**
3-Sex	4	.0961	5.8029	1	122	.1075	*
4,5-Enrollment Level	3	.1160	1.4958	2	122	.2281	

(Table cont'd.)

Table 52 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
MATHEMATICS							
Full Model	5	.1269					
Restricted Models - All variables except:							
2-I.Q.	4	.0885	5.3600	1	122	.0223	*
3-Sex	4	.0641	8.7662	1	122	.0037	**
4,5-Enrollment Level	3	.1160	.7625	2	122	.4687	
FOREIGN LANGUAGE							
Full Model	5	.1482					
Restricted Models - All variables except:							
2-I.Q.	4	.1145	4.8258	1	122	.0299	*
3-Sex	4	.1050	6.1838	1	122	.0142	**
4,5-Enrollment Level	3	.1160	2.3101	2	122	.1036	

TABLE 53

ANALYSES OF THE EFFECTS OF PREDICTOR VARIABLES ON COLLEGE GPA IN ACADEMIC SUBJECTS FOR STUDENTS WHO WITHDREW FROM COLLEGE

Predictor Variables:

1 Unit vector
2 I.Q. (Otis)
3 Sex
4 High level of enrollment in high school subject
5 Other than high level of enrollment in high school subject

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Proba-bility	Signif. * .05 ** .01
ARTS							
Full Model	5	.0971					
Restricted Models - All variables except:							
2-I.Q.	4	.0382	7.9546	1	122	.0056	**
3-Sex	4	.0709	3.5376	1	122	.0623	
4,5-Enrollment Level	3	.0939	.2150	2	122	.8068	
PHYSICAL EDUCATION							
Full Model	5	.0988					
Restricted Models - All variables except:							
2-I.Q.	4	.0458	6.7885	1	122	.0103	**
3-Sex	4	.0725	3.5587	1	122	.0616	
4,5-Enrollment Level	3	.0939	.3311	2	122	.7174	

(Table cont'd.)

Table 53 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
ENGLISH							
Full Model	5	.1211					
Restricted Models - All variables except:							
2-I.Q.	4	.0818	5.54561	1	122	.0211	*
3-Sex	4	.1038	2.4069	1	122	.1234	
4,5-Enrollment Level	3	.0939	1.8882	2	122	.1557	
SOCIAL SCIENCE							
Full Model	5	.1289					
Restricted Models - All variables except:							
2-I.Q.	4	.0828	6.4513	1	122	.0123	**
3-Sex	4	.1048	3.3687	1	122	.0688	
4,5-Enrollment Level	3	.0939	2.4509	2	122	.0904	
SCIENCE							
Full Model	5	.0978					
Restricted Models - All variables except:							
2-I.Q.	4	.0352	8.4596	1	122	.0043	**
3-Sex	4	.0758	2.9687	1	122	.0874	
4,5-Enrollment Level	3	.0939	.2635	2	122	.7688	

(Table cont'd.)

Table 53 (continued)

High School Subjects and Variables	No. Var.	RSQ	F-ratio	df_1	df_2	Probability	Signif. * .05 ** .01
MATHEMATICS							
Full Model	5	.1312					
Restricted Models - All variables except:							
2-I.Q.	4	.0931	5.3445	1	122	.0225	*
3-Sex	4	.0972	4.7676	1	122	.0309	*
4,5-Enrollment Level	3	.0939	2.6173	2	122	.0771	
FOREIGN LANGUAGE							
Full Model	5	.0989					
Restricted Models - All variables except:							
2-I.Q.	4	.0471	7.0070	1	122	.0092	**
3-Sex	4	.0757	3.1369	1	122	.0790	
4,5-Enrollment Level	3	.0939	.3366	2	122	.7148	